INSECTS OF MICRONESIA
Homoptera: Fulgoroidea[1]

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INTRODUCTION

This report deals with fulgoroid Homoptera collected in the course of a survey of the insects of Micronesia carried out principally under the auspices of the Pacific Science Board. Collections have been available from the Palau Islands, made by S. Uchiyama in 1924, S. Murakami in 1937, T. Esaki in 1938, H. S. Dybas in 1944-1945 and 1947-1948, G. Oakley in 1946, H. K. Townes in 1946, K. L. Maehler in 1948, D. B. Langford in 1949, N. L. H. Krauss in 1952, J. L. Gressitt in 1951-1952, and J. W. Beardsley in 1952; from the Yap group, made by Esaki in 1939, Oakley in 1946, Townes in 1946, R. J. Goss in 1950, Gressitt in 1951-1952, and Krauss in 1952; from the southern Mariana Islands, made by Esaki in 1937, K. Yasumatsu and S. Yoshimura in 1940, H. S. Wallace in 1945, Dybas in 1945, G. E. Bohart and Gressitt in 1945, Townes in 1946, Maehler in 1948, Krauss in 1952, and Y. Kondo in 1952; from the northern Mariana Islands and the Bonin Islands, made by Miyanohama in 1934, Motoike and Ise in 1931, Esaki in 1933, A. R. Mead and Kondo in 1949, and R. M. Bohart in 1951; from the smaller Caroline atolls, made by R. H. Baker in 1945, Oakley in 1946, Townes in 1946, Krauss in 1952, and Beardsley in 1953; from Truk and Nama, made by Yasumatsu and Yoshimura in 1940, Townes in 1946, R. W. L. Potts in 1949, D. Langford in 1950, and Gressitt in 1953; from Ponape, made by Esaki in 1939, Oakley in 1946, Townes in 1946, Dybas in 1948, P. A. Adams in 1950, Gressitt in 1953, and J. F. Gates Clarke in 1953; from Kusaie, made by Esaki in 1937, Oakley in 1946, Townes in 1946, and Gates Clarke in 1953; and from the Marshall Islands, made by Wallace in 1945, Oakley in 1946, Townes in 1946, R. L. Usinger in 1950, Ira La Rivers in 1950, Maehler in 1949, and Beardsley in 1953. The Gilbert Island populations, unfortunately, were represented by only one or two specimens. The material examined comprised 6,845 specimens

[1] This represents, in small part, Results of Professor T. Esaki's Micronesian Expeditions (1936-1940), No. 85.

and included about 135 species, of which 69 are described below as new. The overwhelming majority of the captures recorded are new for the area concerned.

Acknowledgments must begin with a well-deserved tribute to the United States Office of Naval Research for its far-sighted action in providing funds for the field work carried out during this survey; another, no less merited, is due to the Invertebrate Consultants Committee for the Pacific of the Pacific Science Board (National Research Council) for the effective manner in which the project has been carried out. Field research was aided by a contract between the Office of Naval Research, Department of the Navy, and the National Academy of Sciences, NR 160-175. Acknowledgment is also due to the authorities of museums which loaned specimens: United States National Museum, Bernice P. Bishop Museum, Museum of Comparative Zoölogy, Chicago Natural History Museum, and the California Academy of Sciences. To all and, in particular, to Dr. J. L. Gressitt, who arranged and coordinated the distribution of specimens, my warmest thanks are tendered for the opportunity and privilege of examining this valuable assemblage of material.

HISTORY

In 1854 Stål described a species, *annulipes,* from Guam which he referred to *Delphax;* and five years later he added a further species, *Delphax granulinervis,* from the same island, together with two new species from Ponape (*Ugyops kinbergi* and *Armacia clara*). Apparently no further collections of Micronesian fulgoroids were made until 1911, when Fullaway recorded his Guam captures in governmental publications or passed them on to Muir, who reported them in 1913. Soon afterwards, in 1914, Matsumura described a new tropiduchid genus (*Mesepora*) based on three new species, together with a new species of *Kallitaxila,* from the Bonin Islands. After a lapse of 30 years, during which no more species were recorded, a substantial addition was made with the publication in 1946 of the homopterous part of the results of the insect survey of Guam by Bishop Museum (Insects of Guam—II) which included contributions both by Swezey and Metcalf. Four years later Metcalf published the results of his studies of material taken in the eastern Caroline Islands, and he has recently (1954) followed this with a further account.

In the present report 54 genera and 135 species are listed as belonging to the Micronesian fauna, and of these all the genera and 129 of the species have been examined. As the reliability of records of species belonging to groups poorly characterized in literature is now uncertain, I follow the policy of accepting unconfirmed records at their face value unless the evidence is weak. Of such records those of *Myndus palawanus* Muir, *M. seminiger* Muir, *Ugyops samoaensis* Muir, and *Capelopterum punctatellum* Melichar are considered unacceptable in the light of the data presented below.

GEOGRAPHICAL DISTRIBUTION

The collections are divided between families as follows:

	Genera	Species	Specimens
Cixiidae	5	27	762
Delphacidae	16	47	2,511
Meenoplidae	1	1	66
Derbidae	17	31	2,455
Achilidae	1	1	2
Dictyopharidae	1	1	137
Tropiduchidae	6	12	313
Issidae	2	9	180
Flatidae	1	1	22
Ricaniidae	4	5	397
	54	135	6,845

Some 83.5 percent of the total captures was made up of Cixiidae, Delphacidae, and Derbidae. To the total number of cixiids taken, no less than 26.1 percent was contributed by series of the single species *Euryphlepsia pallescens,* whereas species of the genus *Myndus* accounted for another 64.5 percent. The delphacid total was inflated by the strong representation of *Ugyops kinbergi* (14.0 percent), *Peregrinus maidis* (10.1 percent), *Tarophagus proserpina* (12.3 percent), *Euidellana carolinensis* (7.2 percent), and *Delphacodes propinqua* (7.8 percent), whereas four other species, *Ugyops superciliata,** *Chloriona fieberi, C. kolophon,* and *Coronacella kirkaldyi* account for 20.0 percent. The outstandingly common derbids were *Flaccia dione,** which made up 18.9 percent of the total, and *Lamenia caliginea,* which contributed 14.3 percent. The collection of *Swezeyia,* irrespective of species, comprised 15.0 percent of the total, and that of *Phaciocephalus* 25.4 percent. The Issidae were virtually restricted to weak species of *Issarius* and the Ricaniidae largely to *Armacia.* The only dictyopharid, *Chanithus,* and the only meenoplid, *Nisia*—both widespread in the Orient—may well have been introduced by human agency; and it is likely that the continental flatid and ricaniids of the Bonin Islands have been similarly introduced.

The genera listed below include seven to which only Micronesian species are assigned so far, though it is probable that these will ultimately be found in the Philippines or in Formosa. The remaining genera are widespread along the eastern Asiatic seaboard. The distribution of species is shown in the following distributional list, which includes species recorded in literature as well as those represented in the material examined.

* Described as new.

Distributional List of Micronesian Fulgoroidea

	Micronesian Island Groups				Caroline								Other Localities
	Bonin	Volcano	N. Mariana	S. Mariana	Palau	Yap	Caroline Atolls	Truk	Ponape	Kusaie	Marshall	Gilbert	
Cixiidae													
1. Bennaria consul*					X								
2. B. praetor*						X	X						
3. Myndus bifurcatus				X									
4. M. nearchus*				X			X						
5. M. dibaphus*				X				X					
6. M. polyctor*				X									
7. M. marginatus									X				
8. M. irreptor*				X									
9. M. praecanus*									X		X		
10. M. orion*									X				
11. M. oxalme*							X	X					
12. M. o. namanus*							X						
13. M. niger									X				
14. M. orestes*									X				
15. M. ophiuchus*										X			
16. M. uniformis									X				
17. M. aphrodite*										X	X		
18. M. cressida*				X									
19. M. apicalis							X	X	X	X	X		
20. M. fusciterminalis									X				
21. M. spp.				X	X	X	X		X				
22. Euryphlepsia pallescens					X								
23. Dystheatias orpheus*					X								
24. D. tyndaris*								X					
25. D. telamon*					X								
26. Oliarus carolinensis									X				
27. O. trachas*									X				
28. O. ogasawarensis	X												
29. O. boninensis	X												
Delphacidae													
30. Ugyops kinbergi									X				
31. U. k. guahoni*				X									
32. U. k. palauana*					X		X						
33. U. k. civilis*						X	X	X					
34. U. k. magas*											X		
35. U. k. kusaieana*										X			
36. U. k. subspp.							X						
37. U. superciliata*							X		X	X	X		
38. U. vittatus	X												Ryukyu Is.
39. U. annulipes				X									
40. U. a. pisana*							X	X					
41. U. ariadne*						X	X						
42. U. apollo*									X				
43. U. anatahani*			X	X									
44. U. rotana*				X									
45. U. eos*							X						
46. Melanesia similior*									X				
47. Livatiella constellaris*								X	X				
48. L. chrysops*									X				
49. Melanugyops erebea*									X				
50. Perkinsiella bakeri					X	X							Philippine Is.

* Described as new.

	Micronesian Island Groups												Other Localities
					Caroline								
	Bonin	Volcano	N. Mariana	S. Mariana	Palau	Yap	Caroline Atolls	Truk	Ponape	Kusaie	Marshall	Gilbert	
51. P. thompsoni				×	×	×		×					Java
52. Peregrinus maidis	×			×	×	×							cosmopolitan
53. Tarophagus proserpina				×	×	×	×	×	×	×	×		Amboina, widespread in S. Pacific
54. Dicranotropis cognata					×	×							Queensland, Fiji, Philippine Is., Samoa
55. Phyllodinus granulinervis				×	×	×	×						Formosa
56. P. nigromaculosus				×	×	×	×						Philippine Is., Papua
57. Euidellana carolinensis				×	×	×	×		×	×			
58. Stenocranus agamopsyche				×	×	×							Queensland, Philippine Is.
59. S. pacificus					×								Fiji
60. Sardia pluto					×	×	×		×	×			S. Asia, Australia, S. Pacific
61. Chloriona furcifera				×	×				×		×		Japan, Formosa
62. C. kolophon	×			×	×	×	×	×	×		×		Queensland, Philippine Is.
63. C. formosella				×		×							Formosa
64. C. eupompe				×	×		×						Australia, S. Pacific
65. C. euterpe*				×	×	×							
66. C. kyusyuensis						×							Japan
67. C. geranor				×	×	×							Queensland
68. C. paludum				×	×	×	×	×	×	×	×	×	Hawaii
69. C. fieberi				×	×	×							Philippines, Ceylon
70. C. albotristriata†				×									Queensland
71. C. ochrias†				×									Australia, Fiji
72. Nilaparvata lugens					×	×							Java, Philippines, China
73. Delphacodes propinqua				×	×	×							Japan, Philippines
74. D. matanitu				×	×	×							Queensland, Fiji, Samoa
75. D. striatella					×	×					×		Europe, Philippines
76. D. lyraeformis				×		×	×						Japan
77. D. albicollis				×	×	×							Europe, Asia
78. D. amblystylis*				×									
79. D. marpessa*						×							
80. D. thersander*								×					
81. D. celaeno*							×						
82. D. dryope†				×									Queensland, Samoa, Fiji
83. Coronacella kirkaldyi				×	×	×	×	×	×	×	×		Queensland, Formosa, Samoa, Philippine Is., Tahiti, Fiji
Meenoplidae													
84. Nisia atrovenosa				×	×	×							Old World tropics
Derbidae													
85. Zoraida pterophoroides fistulator					×								

† Tentative identification requiring confirmation.

	Micronesian Island Groups												Other Localities
					Caroline								
	Bonin	Volcano	N. Mariana	S. Mariana	Palau	Yap	Caroline Atolls	Truk	Ponape	Kusaie	Marshall	Gilbert	
86. Proutista moesta				X	X		X						Indonesia, Formosa, Japan, Philippine Is.
87. Sikaiana palaui*					X								
88. Muiria palauana*					X								
89. Platocera calypso*					X								
90. Heronax achilles*					X								
91. Heronax sp.					X								
92. Paralyricen soranus*					X								
93. Flaccia dione*							X			X	X		
94. Kamendaka jokaji*									X				
95. K. lar*						X	X						
96. K. perplexa									X				
97. K. polyphemus*										X			
98. K. sp.					X								
99. Swezeyia zephyrus*				X	X		X	X	X	X	X	X	
100. S. polyxo*					X	X	X	X					
101. S. metanira*					X								
102. S. typhon*					X								
103. S. ganesa*					X	X	X	X				X	
104. Kampulokara sp.								X					
105. K. sp.					X								
106. Eusyphax bivittatus				X									
107. E. b. ianthe*						X							
108. E. b. lineatus*				X	X								
109. Nesokaha infuscata palauana*					X								
110. Nesorhamma chalcas*					X								
111. N. c. atrior*					X								
112. N. badia				X									Philippine Is.
113. Lamenia caliginea charon*											X		Society Is., Fiji, Samoa, Ellice Is., Tonga, Marquesas Is.
114. L. c. onoensis										X			
115. L. c. fullawayi				X									
116. L. c. ponapeana*							X		X				
117. L. c. sory*							X	X					
118. L. c. dira*							X						
119. L. c. yapana*					X	X	X						
120. L. c. thyestes*							X						
121. L. c. subsp.							X						
122. L. numitor*				X		X	X						
123. L. n. buto*					X		X						
124. L. n. sordida*							X		X				
125. L. n. procne*							X						
126. L. candida*				X	X	X	X						
127. Phaciocephalus zethus*					X				X				
128. P. carolinensis							X	X					
129. P. phaedra*				X			X	X	X	X			
130. P. paschalis*							X	X	X				
131. P. onoi								X					
132. Levu matsumurae guamana				X									Formosa

	Micronesian Island Groups												Other Localities
					Caroline								
	Bonin	Volcano	N. Mariana	S. Mariana	Palau	Yap	Caroline Atolls	Truk	Ponape	Kusaie	Marshall	Gilbert	
133. L. m. appressa								×					
134. L. m. ponapeana*									×				
135. L. m. palauensis*					×								
136. L. pallescens				×		×							
137. L. p. pagana*									×				
138. L. p. lactinea*					×								
139. L. p. haedulus*								×					
Achilidae													
140. Argeleusa rhanis*					×								
Dictyopharidae													
141. Chanithus gramineus				×	×	×							Asia
Tropiduchidae													
142. Leptovanua serapis*								×	×				
143. L. telamon*						×							
144. L. t. palauana*					×								
145. Tambinia guamensis				×									
146. T. sisyphus*					×								
147. T. baucis*						×							
148. Swezeyaria viridana				×									
149. S. v. unicolor									×				
150. S. v. constricta*							×	×					
151. S. v. orientalis*										×			
152. S. damo*									×				
153. Nesotemora cinyras*					×	×							
154. Kallitaxila suturalis	×												
155. Mesepora issiformis	×												
156. M. boninensis	×												
157. M. ogasawarana	×												
Issidae													
158. Issarius carolinensis								×					
159. I. c. nassa*									×				
160. I. surenas*				×									
161. I. doricha*					×								
162. I. troilus*										×			
163. I. tartarus*				×									
164. I. nestor*					×								
165. I. panope*				×									
166. I. iole*						×							
167. Atylana farrago*								×					
Ricaniidae													
168. Armacia clara									×				
169. A. c. trukensis*							×	×					
170. A. c. namana*							×						
171. A. c. kusaieana*										×			
172. A. simaethis*					×								
173. Ricanoptera syrinx*						×							
174. Ricanoides flabellum	×												
175. Euricania ocellus fascialis	×												
Flatidae													
176. Mimophantia maritima	×												

Faunas of archipelagoes show a strong tendency toward symmetry; in other words, equal-sized islands of the same topographical build in the same group of islands tend to have equivalent (but not identical) faunas. In the light of this principle, the absence of a representative of the *Levu matsumurae* complex from the Yap group—though the species is represented to the southwest (Palau Islands), northeast (Mariana Islands), and east (eastern Caroline Islands)—must, for the time being, be attributed to incomplete collecting. Indeed, a close comparison of the species suggests that several such gaps remain to be filled.

The island groups of Micronesia are distributed in a Y-shaped pattern, with the base almost resting on northwestern New Guinea; one branch extends for more than 2,000 miles northward to the Bonin Islands, and the other extends 3,000 miles east to the Marshall Islands. Over such distances diminution in the richness of the fauna relative to that at the source of supply might be expected, but accurate comparison is rendered difficult by topographic variation. Of the species examined, some 65 occur in the Palau Islands, 44 in the Yap group, 51 in the Marianas, 29 in Truk and Nama, 37 in Ponape, 15 in Kusaie, and 14 in the Marshall Islands. The general drift of the figures suggests a sudden decline north and east of the Palaus, a second decline east of Yap, then a steady level to Ponape followed by an abrupt fall farther east.

The character of the fauna, as expressed by the genera and species present, seems to be relatively constant from the Palaus to the Marianas and the eastern Carolines. The little material available from the Marshall Islands contains a few novelties, whereas some of the genera from the Bonin Islands are quite alien to the Micronesian fauna. Matsumura described three nominal "species" of *Mesepora* from the Bonins. It seems most unlikely that the absence of any species of this genus from the Palaus, Marianas, and Carolines is attributable to incomplete collecting.

Almost as interesting is the fact that Matsumura apparently never reported from the Bonin Islands any species of *Swezeyaria,* which is widespread in and south of the Marianas. Even on this limited evidence there seems to be a substantial discontinuity between the native faunas of the Marianas and the Bonin Islands, quite apart from recent incursive elements.

The Caroline Islands form an arc, or band, parallel to the northeastern coast of New Guinea and, except at the western end, are separated from it by 300 to 600 miles of open sea. The nature of the fauna shows that it did not come from the north, via the Bonins. Therefore the possibilities which have to be considered are (a) that Fulgoroidea entered Micronesia from the southern Philippine Islands first through the Palaus then progressively through the Marianas and Carolines, in an order determined by relative geographical location; (b) that they entered Micronesia along the whole Caroline arc by

emigration east from the Philippines and due northeast from New Guinea, along the whole of its length; (c) that they came in via the Gilbert and Marshall Islands; or (d) that they invaded Micronesia by a "pincer-movement" from west and east. The third possibility can be rejected at once. There is little evidence by which to choose between a and b; but weight must be given to the facts: the Palaus have a richer fauna, with elements (*Zoraida, Platocera,* and *Bennaria*) not found in the rest of the Carolines, and the eastern Carolines, which might be expected, on hypothesis b, to have at least a few New Guinea forms not present in the Palaus, have none. It seems probable that the route via Palau was much used.

At the other end of the Micronesian archipelago, in the Marshall Islands, the position is abruptly changed: *Flaccia* is found there but not farther west than Kusaie. A distinctive species of *Ugyops* makes its appearance and reaches as far west as Ponape, whereas the remaining species are mostly of pan-Pacific distribution. The Marshall Islands, on this evidence, have not acquired all elements of their fauna from the Caroline Islands, and it is possible they have acquired very few. *Flaccia* is known only from Fiji; and in view of its abundance on Ine Island in the Marshalls and its total absence west of Kusaie, it must be considered of Melanesian origin and as having probably entered the Marshall Islands via the Ellice Islands-Gilbert Islands route. As previously mentioned, the species of *Ugyops* taken in the Marshall Islands is appreciably different from the *U. kinbergi* complex found to the west, but does not closely resemble any species reported from Fiji.

The tropiduchid genus *Leptovanua* found throughout Micronesia west of the Marshall Islands has been described from the Solomon Islands and is represented in Amboina and Obi. Its counterpart in Fiji and Samoa is *Vanua,* which is not yet known farther west than Fiji. As the two genera are very similar, it might be suspected that *Vanua* is the "end form" of a chain of *Leptovanua.* The basic differences in both the structure of the head (see key to Tropiduchidae) and the form of the genitalia, however, completely dispose of such a hypothesis. The questions of whether *Vanua* extends north of Fiji and of whether it ever occurs side by side with *Leptovanua* are still open, but it is clear that when the Tropiduchidae of the Marshall, Gilbert, and Ellice Islands are collected they may provide valuable information on these points.

An interesting parallel to the above is afforded by the Ricaniidae. In Micronesia the only common and widespread genus is *Armacia* Stål; in Fiji and Samoa a perfect faunistic counterpart is found in *Plestia.* Again, the distribution of either in the Marshall, Gilbert and Ellice Islands is unknown, though it is to be suspected that no Ricaniidae occur in the Marshall Islands.

The position in Issidae is rather different. Apart from certain taxonomic difficulties, we find two main recognizable "genitalic" groups which are

present in both Micronesia and Melanesia. The Melanesian island fauna, however, is richer possessing in addition the Australasian *Lollius* Stål, the known northward distribution of which terminates in Fiji.

SUBGENERIC AFFINITY: ITS RANGE AND TAXONOMIC TREATMENT

The guiding principles which have been used in assessing the importance of constant morphological differences between island population samples are the same as those already discussed by me (1950, B. P. Bishop Mus., Bull. **202**: 9-12). In the collections dealt with in this paper the most satisfactory examples of what constitute widely separated species are found in the genus *Myndus* (material from Guam), in *Lamenia* (material from Palau), in *Phaciocephalus* (material from Ponape), and in *Swezeyaria* (material from Ponape). In none of these is the taxonomic status of the concept in any doubt, and such yardsticks can confidently be used in assessing the differences found between population samples from different islands. Such literal emphasis on the "unbridgeable gap" represents the limit of conservatism; and it is fully realized how poor an alternative such assessment must be for actual experimental investigation. The results of such an approach may at first sight appear illogical. *Ugyops*, for instance, as treated below comprises in Micronesia one complex of subspecies grouped under *U. kinbergi* and another complex, this time of species, grouped around *U. annulipes* Stål. The morphological evidence provided by the specimens shows that in one series, *U. annulipes* populations, the differences are more numerous and more obvious than in the *U. kinbergi* populations. The simplest conclusion, though not necessarily the correct one, is that speciation has proceeded farther in the *annulipes* populations than in those of *U. kinbergi*. Such a conclusion can be accounted for by assuming either that intrinsic change has proceeded more slowly in the *U. kinbergi* populations or that *U. kinbergi* arrived in Micronesia at a later date than *U. annulipes* and that both are changing at the same rate.

The question of temporal stratification of the faunas of oceanic islands deserves closer study than it has received. In a taxonomy in which the species is the unit a broad division is established between endemic species and immigrant species. An immigrant species is one in which the specific characters have not disappeared since the insect first established itself, and in which no new characters of specific value have appeared. On this basis, the derbid *Lamenia caliginea* Stål, which is widely spread among the southwestern Pacific islands, is on the same footing as the recently incursive *Perkinsiella saccharicida* in Hawaii. Such a rating completely obscures the essential difference between them, which is that the *Perkinsiella* population in Hawaii is in no way differentiated from the parent Australian population from which its progenitors have so recently been derived, whereas the populations of *Lamenia*,

as far as they have been critically studied, differ recognizably between islands. *Lamenia caliginea,* in short, forms a *Rassenkreis* in the Pacific, whereas *Perkinsiella saccharicida* does not. The conclusion that *Lamenia caliginea* has been in the islands of the western Pacific longer than *Perkinsiella* has been in Hawaii has historical support. This simple case represents the bottom two steps of an ascending series of progressive differentiation, and the upper of these steps is given taxonomic expression by the use of a subspecific epithet. A third step is represented by the "good" species. Now, at least in Pacific Fulgoroidea, some of the forms examined differ in a degree which seems excessive for a "subspecies" but in which the morphological gap, though unbridged in the samples, is not very wide. In contrast, one or two forms differ strikingly indeed. The wide gap which so clearly separates the last-mentioned species raises a doubt as to whether the much smaller gap which separates those in other groups is a justifiable criterion of species. The doubt is increased when each of such less distinct forms is found in one island only. The choice obviously lies between a *Rassenkreis* and an *Artenkreis*. There is no positive evidence which will settle the point in favor of the former alternative, whereas the coexistence of two rather similar forms side by side serve to establish the latter conclusively (for example, the Oca Point, Guam, populations of *Myndus*). This evidence of non-interbreeding of populations enables a specific epithet to be applied with assurance to forms with such a distributional overlap. This, however, is of mainly nomenclatorial significance. There still remain larger degrees of difference to be noted and accounted for before the generic level is reached.

The degrees of difference considered up to this point, taken in conjunction with the distribution of the specimens examined, form a picture which is consistent with the assumption that an initial invading progenitor species in each genus has established itself on one island after another and that, in due course, its local (insular) populations have developed different characters from each other and different from those of the parents. If it is also assumed that the populations of any one genus have done this at the same speed in each island, the equal degree of difference observed when samples from any two islands are compared is satisfactorily explained. Such an interpretation accounts for the presence and distribution in the Pacific of issids of the genera *Scalabis* and *Issarius,* of the tropiduchids *Leptovanua* and *Vanua,* of the derbid *Lamenia caliginea,* and of the ricaniid *Euricania.* In these, as in several other genera, the degree of difference between insular populations is in accord with the hypothesis that only one immigration by the progenitor species has taken place. In two-island endemism it is assumed that one of the islands concerned has been colonized comparatively recently by a successful migrant from the other.

If this hypothesis is correct, then the small category of species which differ

strikingly from one another is most simply explained as an indication of immigration by two or more distinct species of the same genus. The species of *Lamenia* described below are of exceptional interest in this respect. *L. caliginea* colonized the western Pacific, and its isolated populations have developed small but characteristic differences. In the Palaus and Yap two other species are found, widely separated morphologically from each other and profoundly so from *L. caliginea.* These, it is assumed, have descended from two late immigrants, one of which has extended its area of colonization to the Yap group. There would seem to be a great interval between the establishment of *L. caliginea* in the Pacific and that of the other two species.

The distribution of *L. caliginea* reasonably suggests that the Philippines or adjacent islands were the original home of their progenitor species. But what conclusions are to be drawn from the coexistence in Ponape of the two astonishingly different species of *Swezeyaria,* when neither seems to occur southwest of the Marianas and one has not been reported outside Ponape? There is no question here of the fragmentation of a single immigrant species. The hypotheses available are (a) both species are present in all large islands west of Ponape but have so far been overlooked or (b) the rarer species has evolved on Ponape, the commoner on some other island, and the latter has successfully colonized the eastern Carolines and Guam. Whether the progenitor of *Swezeyaria,* possibly now untraceable, came from the Bonin Islands or from the Palaus cannot be settled in our present state of knowledge.

The evidence as a whole suggests that the successful establishment of a new fulgoroid immigrant species in Micronesia has always been a rare event. This is understandable, but what is not clear is the reason why the successful species has almost invariably been able to accomplish the difficult task many times over and to colonize other islands before a second species of the genus has obtained even its initial foothold.

It is now established that the western Pacific was invaded by Fulgoroidea along at least two independent routes, the Palau Islands and the Solomon Islands, from sub-continental areas in which the superfamily is exceptionally well represented. This being so, it seems very strange that out of this vast reservoir of forms virtually the same few genera have been successful along each route. Derbidae feed on fungus growing in rotting vegetation, and the difficulties of establishment in the forests of a high Pacific island would seem to be relatively slight. Perhaps it is on this account that Derbidae, structurally among the frailest of Homoptera, are so well represented in Pacific insular faunas. Even so, the number of genera present is relatively low. Of the Issidae, which feed on the semi-woody or woody stems of a wide range of plants, only *Scalabis, Issarius,* and *Atylana* are widespread. This success over many potential competitors in the same family has been achieved inde-

pendently along each route of immigration. It seems to me that the investigation of this problem calls for a careful study of the host plants preferred for feeding and oviposition by these issids, including the abundance of acceptable host plants in the floras of the islands colonized by these genera.

LOCATION OF TYPES

With some exceptions mentioned below under relevant species, the holotypes of new species have been deposited in the United States National Museum, Washington. The following symbols indicate the museum in which specimens are deposited: US (United States National Museum), BISHOP (Bishop Museum), KU (Kyushu University), CAS (California Academy of Sciences), CM (Chicago Natural History Museum), and MCZ (Museum of Comparative Zoölogy).

KEY TO FAMILIES OF FULGOROIDEA

1. Second post-tarsal segment not very small in relation to first, armed with a row of spines at apex; apex truncate or emarginate........ 2
Second post-tarsal segment small in relation to first, devoid of spines at apex or with a single spine at each side; apical margin usually rounded or subconical 10

2 (1). Anterior or posterior claval vein bordered with conspicuous secretory pores or tubercles........ 3
Neither claval vein tuberculate; if granules present, then along all veins of corium........ 4

3 (2). Labium with apical segment much longer than wide, rounded or conical at apex, median ocellus generally present on frons; the sixth, seventh and eighth abdominal tergites bearing tracts of wax-secreting pores. Male genitalia with a tubular phallobase; ovipositor reduced or absent ....**Meenoplidae**
Labium with apical segment about as broad as long, except in *Vinata*, abruptly truncate and flattened at apex, no median ocellus on frons; ninth tergite of male fused with anal segment and not with pygofer. Ovipositor with valvulae short or reduced, pregenital sternite usually produced ....**Derbidae**

4 (2). The sixth, and often seventh and eighth, abdominal tergites bearing tracts of wax-secreting pores. Male genitalia with a tubular phallobase, ovipositor with valvulae small or reduced........**Kinnaridae**
Tracts of wax-secreting pores absent from abdominal tergites, or, if present, then anal area of hind wings with reticulate venation........ 5

5 (4). Anal area of hind wings with dense network of irregular veins. Phallobase of male in form of a tubular membranous sac; phallus reduced to a sclerotized ring with simple appendages; ovipositor with valvulae short and stout........**Fulgoridae**
Anal area of wings not reticulate........ 6

6 (5). Tegmina with claval suture not quite reaching margin (clavus open); united claval veins entering apex; ovipositor with an accessory lobe below first valvulae at base........ 7
Tegmina with claval suture reaching margin (clavus closed); united claval veins entering commissure near apex........ 8

7 (6). Base of abdomen slightly produced laterally on each side into one or two short broad processes, each hollowed out into three hemispheroidal depressions. Tegmina relatively long and narrow, tectiform in repose. Aedeagus with a short simple, widely tubular phallobase............**Achilixiidae**

Base of abdomen devoid of lateral processes. Tegmina usually overlapping distally in repose, rarely long and tectiform. Aedeagus much retracted into body, phallobase tubular, not short, usually with complete armature ....**Achilidae**

8 (6). Post-tibiae with a long mobile spur at apex. In most genera a transverse carina on genae below antennae. Aedeagus tubular, sometimes withdrawn into a crypt, if long, often recurved and membranous distally; ovipositor long, curved, ensiform............**Delphacidae**

Post-tibiae without a mobile spur............ 9

9 (8). Vertex often markedly produced before eyes; if not, disc of frons with sub-median longitudinal carinae or tegulae absent and claval suture of tegmina obscure. Median ocellus absent from frons. Aedeagus with phallobase in form of a tubular membranous sac. Ovipositor never ensiform, valvulae usually short; if prolonged then porrect, not curved............**Dictyopharidae**

Vertex rarely much produced before eyes, disc of frons without submedian longitudinal carinae, carinate at lateral margins and usually medially. Median ocellus often present. Tegulae present. Tegmina with claval suture distinct. Aedeagus tubular, often membranous and recurved distally, or expanded and complex. Ovipositor with valvulae long, curved, ensiform or if short, narrow and porrect beneath a vertical ovate tract of wax-secreting pores on hind surface of ninth segment............**Cixiidae**

10 (1). Second post-tarsal segment with a spine on each side, apical margin rounded or subconical............11

Second post-tarsal segment small, devoid of spines............16

11 (10). Adult with antennal flagellum segmented. Lateral ocelli not outside lateral carinae of frons; clypeus shallowly rounded with lorae (mandibular sclerites) broadly visible from front. Tegmina leathery. Genital styles narrow or fused into a broad lobate plate, aedeagus saclike with supporting sclerites. Ovipositor with valvulae reduced or absent............**Tettigometridae**

Adult with antennal flagellum not distinctly segmented. Lateral ocelli outside lateral marginal carinae of frons, usually anteroventrad of eyes; lorae forming a distinct angle with clypeus, little visible from front............12

12 (11). Mesonotum with posterior angle separated from disc by a transverse groove; post-trochanter usually directed caudad. Aedeagus usually tubular, laterally compressed, with distal portion membranous and more or less retracted within basal portion............**Tropiduchidae**

Mesonotum without a transverse groove between posterior angle and disc; post-trochanter directed ventrad; aedeagus with a distinct phallobase............13

13 (12). Tegmina with pustules (secretory pores) in basal half of clavus and often between R and M basally; costal vein submarginal, costal area traversed by numerous veinlets............**Flatidae**

Tegmina not as above............14

14 (13). Disc of mesonotum longer than broad; tegmina with basal cell relatively large; ocelli present............15

Disc of mesonotum usually broader than long; tegmina with basal cell very small or obscure; ocelli present or absent............**Issidae**

15 (14). Tegmina with costal vein at margin throughout or margin thickened below and flanged; hind tibiae unarmed, clypeus not carinate..**Issidae (Acanaloniinae)**
Tegmina with costal vein distinctly submarginal, clypeus usually laterally carinate, hind tibiae armed........**Nogodinidae**

16 (10). Tegulae small, partly overlapped by pronotum; post-tibiae with five spines at apex, basal metatarsal joint not inflated, with four or five spines apically........17
Tegulae moderately large to large; post-tibiae almost invariably with eight to ten spines at apex, basal metatarsal joint inflated; minutely and densely pilose, or with more than five spines distally (if with five, both on post-tibiae and basal metatarsi apically, then vertex short, tegminal venation not reduced and wings ample)........18

17 (16). Abdominal spiracles large and exposed; antennae with third joint minute; tarsal arolia large, fully two-thirds as long as ungues, with supporting sclerites; compound eyes normal........**Gengidae**
Abdominal spiracles minute and obscure; antennae with third joint exceptionally large; tarsal arolia minute, delicate, devoid of supporting sclerites; compound eyes reduced........**Hypochthonellidae**

18 (16). Mesonotum relatively long, with lateral discal carinae curving strongly mesad anteriorly; post-trochanters normally rocking in an oblique (mesoventrad-laterodorsad) plane, rarely transversely; basal metatarsal joint normally shorter than second plus third, rarely equal. Anal segment of female and valvulae of ovipositor not ceriferous. Tegmina with basal cell normally large, broad, and polygonal, giving off three or four sectors; costal area usually containing only a few large quadrate cells, rarely very many........**Ricaniidae**
Mesonotum short, broadly triangular; post-trochanters rocking in a horizontal (mesad-laterad) plane; basal metatarsal joint normally longer than second plus third; anal segment of female and/or third valvulae of ovipositor normally ceriferous or, if not, tegmina more than twice as long as broad and third valvulae not denticulate; tegmina with basal cell normally not large; if distinct, then at least twice as long as broad, oval-subrectangular, giving off three sectors; costal area, when present, with oblique and often narrow cells or without cross veins........19

19 (18). Vertex not three times as broad as long in middle line; head with eyes normally narrower than pronotum, abdomen rarely broad and depressed........**Lophopidae**
Vertex fully three times as broad as long in middle line, head with eyes as wide as pronotum; abdomen broad, dorsoventrally depressed........**Eurybrachyidae**

Family Cixiidae Spinola

Key to Genera of Cixiidae of Pacific, Including Philippines and Australia (Adapted from Muir)

1. Genae strongly expanded laterally below antennae forming an apparent subantennal process........42
No process on genae below antennae........2

2 (1). Tegmina with Sc, R, and M arising separately from basal cell, not united, tegmina steeply tectiform........3
Tegmina with Sc, R, and M not arising separately from basal cell, Sc and R or all three united in a common stem; tegmina steeply or shallowly tectiform........4

3 (2). Procoxae with outer margin straight....**Andes** Stål
Procoxae with outer margin considerably produced and rounded....
....**Parandes** Muir
4 (2). Tegmina with Sc and R united for part of length, M arising from basal cell or from base of Sc+R but not forming a common stem.... 5
Tegmina with M arising from Sc+R some distance from base, forming a distinct common stem Sc+R+M....36
5 (4). A long slender process on each side at base of abdomen. Tegmina steeply tectiform 6
Base of abdomen without processes. Tegmina steeply or shallowly tectiform 7
6 (5). Median carina of frons distinct....**Benna** Walker
Median carina of frons absent or indistinct....**Bennaria** Melichar
7 (5). Tegmina steeply tectiform with apical margins contiguous when at rest; ovipositor usually ensiform, with valvulae elongate, distally upcurved; ninth segment of abdomen in female posteriorly rounded or flattened.... 8
Tegmina shallowly tectiform with apical margins not contiguous when at rest; ovipositor with valvulae porrect, often rather short; posterior surface of ninth abdominal segment of female flattened....17
8 (7). Vertex generally much produced in front of eyes, conical in outline or at least twice as long in middle line as broad at apex.... 9
Vertex not much produced in front of eyes, or not twice as long in middle line as broad at apex....12
9 (8). Clypeus without lateral carinae; frons with median carina absent or developed only in apical half....**Gelastocephalus** Kirkaldy
Clypeus carinate laterally; medial carina on frons distinct....10
10 (9). Frons devoid of median carina, much narrowed at base....**Tarberus** Jacobi
Frons with median carina distinct....11
11 (10). Length of vertex in middle line much greater than width at base, anterior marginal carina acutely angulate....**Nesocharis** Kirkaldy
Length of vertex less than width at base....**Nothocaris** Muir
12 (8). A transverse carina across vertex basad of apical marginal carina, base of vertex truncate or shallowly concave....**Leptolamia** Metcalf
Vertex devoid of a transverse carina basad of anterior marginal carina....13
13 (12). Vertex distinctly angulately emarginate at apex....**Kirbyana** Distant
Vertex truncate at apex or nearly so....14
14 (13). Vertex longer in middle line than wide at apex....**Dystheatias** Kirkaldy
Vertex wider at apex than long in middle line....15
15 (14). Base of frons visible from above, tegmina three times as long as broad....
....**Epaustraloma** Fennah
Base of frons not visible from above, tegmina much less than three times as long as broad....16
16 (15). Frons at widest part about 1.5 times width at base; apical margin of tegmina distinctly oblique....**Ptoleria** Stål, **Eucarpia** Walker
Frons at widest part about 2.5 times width at base; apical margin of tegmina broadly rounded....**Australoma** Kirkaldy
17 (7). Mesonotum with five carinae....18
Mesonotum with fewer than five carinae....22
18 (17). Frons and clypeus devoid of median carina....**Huttia** Myers
Frons with a median carina, sometimes developed only in part....19
19 (18). Median carina of frons obscure at base, forked about middle; vertex without a transverse carina....**Malpha** Myers
Median carina of frons simple or forked basad of middle....20

20 (19). Vertex with an angular transverse carina basad of anterior marginal carina which it touches to cut off two areolets in lateroapical areas; post-tibiae with fewer than 20 spines apically........21
Vertex with subapical transverse carina not touching apical margin; post-tibiae with about 20 small spines along apex........**Nesopompe** Kirkaldy

21 (20). Vertex about four times as long as wide at base, extending before eye for almost half length of an eye. Medioventral process of pygofer distally widened in ventral view........**Urvillea** Kirkaldy
Vertex relatively shorter. Medioventral process of pygofer not as above........**Oliarus** Stål

22 (17). Antennae as long as frons, second segment much longer than wide........**Solonaima** Kirkaldy
Antennae much shorter than frons, second segment at most only a little longer than wide........23

23 (22). Clypeus convex, inflated, without a median carina........**Semo** White
Clypeus with a median carina........24

24 (23). Carina between vertex and frons obsolete, median carina of frons absent or present only in part........25
Carina between vertex and frons and median carina of frons distinct........26

25 (24). Frons less than 1.5 times as broad as long in middle; pronotum posteriorly angulately emarginate; tegmina with M_{1+2} forked basad of subapical transverse veins........**Kuvera** Distant
Frons about twice as broad as long in middle when viewed anteriorly at a right angle to face; posterior margin of pronotum roundly concave; tegmina with M_{1+2} forked at or distad of subapical transverse veins........**Betacixius** Matsumura

26 (24). Median carina of frons forking in apical half........**Aka** White
Median carina of frons not as above........27

27 (26). Vertex without a transverse carina basad of anterior marginal carina........28
Vertex with a transverse carina basad of anterior marginal carina........30

28 (27). Vertex much broader than long, truncate at apex; tegmina broad........**Mundopa** Distant
Vertex as long as broad or relatively longer........29

29 (28). Vertex produced before eyes for more than half its median length, anterior margin deeply rounded convex........**Carolus** Kirkaldy
Vertex produced before eyes for less than half its median length, anterior margin angulate........**Colvanalia** Muir

30 (27). Pronotum carinate at lateral margins between eye and tegula........**Calamister** Kirkaldy
Lateral margins of pronotum not carinate; lateral carinae of disc following hind margin of eyes laterad........31

31 (30). Transverse carina of vertex straight or slightly convex........32
Transverse carina of vertex angular, sometimes touching anterior marginal carina at middle........35

32 (31). Procoxae large, profemora and protibiae short and thick........**Cajeta** Stål
Procoxae not large, front legs slender........33

33 (32). Post-tibiae with conspicuous spines........**Koroana** Myers
Post-tibiae without spines or spines, if present, very small........34

34 (33). Frons with disc depressed, lateral margins foliate........**Macrocixius** Matsumura
Frons with disc not depressed, lateral margins not foliate........**Myndus** Stål

35 (31). Post-tibiae with well-developed spines........**Cixius** Latreille
Post-tibiae without spines or spines, if present, very small........**Iolania** Kirkaldy

36 (4). Antennae with second segment longer than broad.......37
Antennae with second segment about as long as broad, tegmina not steeply tectiform.......38

37 (36). Frons widest at apex, tegmina distinctly widening distally, Sc+R+M stalk moderately long.......**Brixia** Stål
Frons widest about level of antennae, tegmina not or only slightly widening distally, Sc+R+M stalk very short.......**Tiriteana** Myers

38 (36). Frons medially carinate throughout or at least near apex, clypeus with well-developed lateral carinae.......39
Frons without median carina; clypeus devoid of lateral carinae....... **Gelastocephalus** Kirkaldy

39 (38). Vertex subtriangular with apex strongly convex, no median ocellus on frons.......40
Vertex five-sided with apex subtruncate or obtusely angulate, frons with median ocellus.......41

40 (39). Vertex and frons medially carinate.......**Carolus** Kirkaldy
Vertex ecarinate, frons carinate only in apical half.......**Tarberus** Jacobi

41 (39). Frons about as broad as long, lateral margins very strongly curved at level of antennae, vertex relatively elongate. Tegmina with Sc+R forked at or distad of middle.......**Myndus** Stål
Frons much longer than broad, lateral margins moderately incurved below level of antennae, vertex slightly broader than long at sides, if at all; tegmina with Sc+R forked in basal third.......**Innobindus** Jacobi

42 (1). Tegmina with Sc and R not united at base or scarcely so.......**Borysthenes** Stål
Sc and R united basally in a long stalk.......43

43 (42). Sc and R forked near stigma, M leaving Sc+R at middle, Sc+R thickened, costal cell large.......**Euryphlepsia** Muir
Sc+R forked considerably before stigma, M leaving Sc+R nearer to base, Sc+R not thickened.......**Stenophlepsia** Muir

Genus **Bennaria** Melichar

Bennaria Melichar, 1914, Philippine Jour. Sci. **9**: 175 (orthotype: *Bennaria bimacula* Melichar, op. cit.).

1. **Bennaria consul** Fennah, n. sp. (fig. 1, *e, f*).

Frons smooth with margins raised, sometimes feebly pustulate at junction with disc, in anterior view longer than broad (3:1).

Testaceous; head, pronotum except on lateral lobes, mesonotum, forelegs, mesotibiae, and tarsi and post-tarsi light brown. Tegmina hyaline, lightly suffused testaceous, powdered pale grayish brown; three small spots in basal third, between R and M, M and Cu, and Cu_2 and first claval vein respectively, an irregular spot at apex of clavus, an irregular series of markings following the line of the subapical cross veins, and growing larger anteriorly, a row of small spots, one in middle of each apical cell, and apical veins at margin, fuscous; veins brown or concolorous, markings sometimes reduced to spot at claval apex and light suffusion over subapical cross veins. Wings hyaline, faintly infuscate, veins fuscous except distally.

Pygofer moderately long, posterior lateral margin distinctly sinuate, medioventral process prominent, triangular. Anal segment relatively long, with lateral margins in profile almost straight, apical margin convex, anal foramen situated in distal third. Aedeagus in basal two-thirds broadly tubular and smooth, in distal third membranous, a stout curved spine arising at apex on right, curved shallowly ventrad, cephalad, then upward, extending basad for half length of aedeagus, at apex on left a pair of more slender spines, one arising

just before the other, curving upward, then cephalomesad, the distal of these spines terminating near middle of aedeagus, the other extending practically to its base; flagellum submembranous, apically subtransverse with a spine on left at apex directed obliquely outward and a longer spine on right, directed anteriorly. Genital styles moderately narrow in basal half, with dorsal and ventral margins subparallel, rather abruptly thickened and curved dorsally, and further expanded in a knob at apex.

Male: length 4.3 mm., tegmen 6.2 mm.; *female:* length 4.0 mm., tegmen 6.0 mm.

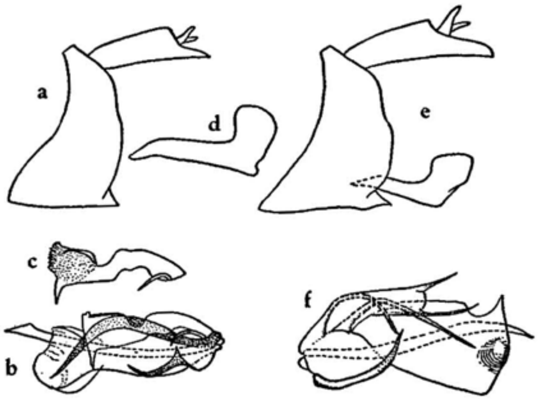


FIGURE 1.—**a-d,** *Bennaria praetor: a,* anal segment and pygofer; *b,* aedeagus; *c,* aedeagal flagellum, dorsal view; *d,* genital style. **e, f,** *B. consul: e,* anal segment, pygofer, and genital style; *f,* aedeagus.

Holotype, male (US 62118), and two males and five females, Ulimang, Babelthuap, Palau, Dec. 1947, Dybas. Babelthuap: North Ngatpang, 65 m., Dec. 1952, Gressitt. Koror: Three males, four females, and one mutilated specimen, Sept. 1951, Gressitt; northeast corner, July 1946, Townes; 25 m., southwest, Dec. 1952, Gressitt, Sept., Nov. 1952, Aug. 1953, Beardsley; Arabaketsu, June 1938, Murakami. Peleliu: Two males and one female; east coast, Aug. 1945, Jan. 1948, Dybas; Akarokuru-Ashiasu-Garudoroko, Aug. 1939, Esaki. Angaur: Two males, Feb. 1948, Dybas. Ngaiangl (Kayangel): One male and one female, Dec. 1952, Beardsley.

DISTRIBUTION: Western Caroline Is. (Palau).

Specimens of this and the following species were compared with Philippine material in the Baker collection at the United States National Museum, as well as with species dealt with by Nast in his recent study of the genus. Both are quite distinct in the structure of the male genitalia.

2. **Bennaria praetor** Fennah, n. sp. (fig. 1, *a-d*).

Generally smaller than preceding species, but of same form.

Testaceous, sometimes fuscous with a line down middle of frons, carinae of head and pronotum and lateral lobes of pronotum testaceous. Tegmina hyaline, powdered gray or grayish fawn. A spot on first claval vein near union of claval veins, joined, in heavily marked specimens, to base of tegmen by a suffusion over Cu_2 and first claval vein, a round

spot overlying M at middle, a spot at apex of clavus, another at fork of M_{1+2}, a quadrate spot in each of cells M_2 and M_{3+4}, a rather narrow but complete line from costal to anal margin overlying subapical cross veins, a narrow suffusion across middle of apical cells of M, and apical veins at margin lightly or heavily infuscate.

Pygofer moderately long, lateral margins slightly sinuate, medioventral process triangular, bluntly rounded at apex. Anal segment moderately long, of same general shape as that of preceding species. Aedeagus tubular, basal third distinctly demarcated by darker pigmentation, a long and very stout sinuate spine arising on right at apex, directed cephalad, then curved mesad to cross aedeagus near its base; on left at apex at point of origin of flagellum two short slender curved spines, one fully 1.5 times length of the other. Flagellum subtubular, constricted slightly distad of middle; apically slightly explanate, with upper surface minutely roughened or shagreened; left apical angle produced in a short straight spine, right apical angle rounded, a slender spine lying along right margin near apex, with its tip curved to right. Genital styles gradually expanding from base, rectangulately bent dorsad in distal third, apically dilated and rounded.

Male: length 3.2 mm., tegmen 5.3 mm.; *female:* length 3.5 mm., tegmen 5.0 mm.

Holotype, male (US 62119), central Yap, July-Aug. 1950, Goss. Yap: Eight males and 11 females, Ruul District, central Yap, Sept. 1939, Esaki, July-Aug. 1950, Goss, July 1951, Gressitt; near Yaptown, July 1946, Townes; Mt. Matade, 60-95 m., Dec. 1952, Gressitt, Oct. 1952, Krauss; hill behind Yaptown, 50 m., Dec. 1952, Gressitt; Gagil, Gatzapar, Sept. 1939, Esaki. Ulithi: Five males and five females, Potangeras Islet, Nov. 1947, Dybas. Fais I.: One male, Oct. 1952, Krauss.

DISTRIBUTION: Western Caroline Is. (Yap, Caroline Atolls).

This species, as indicated above, is distinguished by the shape of the male genitalia. It also differs from *B. consul* in size and in the fuscous pattern on the tegmina.

Genus **Myndus** Stål

Myndus Stål, 1862, Berliner Ent. Zeitschr. **6**: 307 (logotype: *Flata musiva* Germar, 1825, Fauna Ins. Europae **2**: pl. 21).

The Micronesian species assigned below to this genus agree in essential respects with the type species. The post-tibiae are armed apically with six teeth, arranged in two well-separated rows of three; the basal metatarsal joint bears eight teeth on the distal margin, and the second joint bears six.

Metcalf [1954, Elisha Mitchell Sci. Soc., Jour. **70** (1): 3] has proposed genus *Myndorus* for the reception of six species, five of which belong to this group. The generic definition given by Metcalf conflicts with the characters exhibited by the included species, and he makes no comparison between *Myndorus* and any other genus.

The median ocellus is described as indistinct in the generic definition, though it is described as distinct in *Myndorus marginatus*. The frons is given as having a median carina indistinct or wanting ventrally; the pronotum, as having no median carina and the intermediate carinae reaching the posterior border. In all the Micronesian species examined by me the median ocellus is

quite visible, the frons has a complete median carina, the pronotum has a short but sharply defined median carina, whereas the intermediate, or lateral, carinae of the pronotal disc curve laterad parallel to the hind margin and above it, then recurve cephalad and become obsolete. Though very close to the hind margin, they do not unite with it or terminate against it. If adjustments for these differences are made to the definition of *Myndorus,* it applies to *Myndus, Euryphlepsia,* and *Stenophlepsia,* to mention only Old World genera. Metcalf has placed a species of *Euryphlepsia* (*E. palescens*) in *Myndorus,* although it is close to the type species of its own genus. The remaining species cannot be satisfactorily separated from *Myndus* by any character of recognized generic value. Accordingly, I propose to place them in *Myndus* and to regard *Myndorus* as a synonym.

3. **Myndus bifurcatus** Metcalf (figs. 2, *a;* 3, *b, c;* 8, *d-f*).

Myndus bifurcatus Metcalf, 1946, B. P. Bishop Mus., Bull. **189**: 105.

Vertex longer in middle line than broad at level of middle of posterior margin (not quite 1.2:1).

Tegmina with corium hyaline or, at most, suffused dull yellow, membrane hyaline, apical veins at margin and a suffusion over apical cells fuscous.

Aedeagus in profile in form of deep vertical plate, straight on its upper margin and deeply convex on lower: a single long stout spine arising on left side distally, curved in its basal portion and directed cephalad for most of its length, a very small, broadly triangular, spine above it near its base and another below it near its apex. On right side of aedeagus a short slender spine near middle of dorsal margin lying along dorsal edge of vertical plate; this plate triangularly produced to right on its ventral margin, in a small lobe acute at apex.

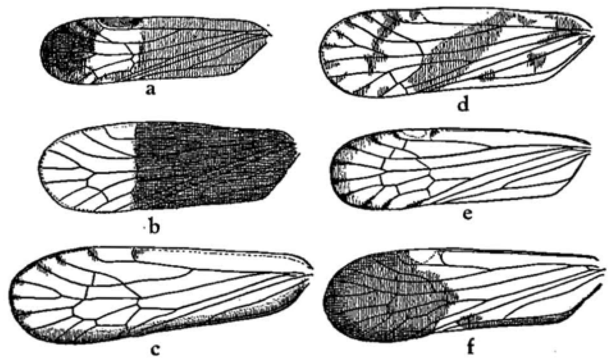


FIGURE 2.—**a,** *Myndus bifurcatus,* tegmen; **b,** *M. dibaphus,* tegmen; **c,** *M. marginatus,* tegmen; **d,** *M. nearchus,* tegmen; **e,** *M. polyctor,* tegmen; **f,** *M. niger,* tegmen.

DISTRIBUTION: Southern Mariana Is.

S. MARIANA IS. GUAM: Three males and two females, Pt. Ritidian, June 1945, Bohart and Gressitt; Piti Pt., June 1945, Dybas.

Two males were dissected, and the aedeagus was found to be as figured.

4. Myndus nearchus Fennah, n. sp. (figs. 2, *d;* 4, *a, b*).

Vertex longer in middle line than broad at level of midpoint of posterior margin (slightly more than 1.4 : 1). Median carina of frons weakly salient in profile, basal margin in anterior view almost transverse.

Pale stramineous; a broad band on each side of middle of frons and clypeus, anterior part of second antennal segment, femora, except at apex, fuscous, also sometimes a spot on pronotum behind eyes and a suffusion on disc of mesonotum and on thoracic pleurites and abdomen. Tegmina hyaline, powdered grayish, usually with a suffusion at base, extending also over most of basal third of clavus, a spot at junction of claval veins, an oblique fascia from apex of clavus to costal margin near middle, subapical cross veins, and apical veins at margin dull yellow, yellowish fuscous, or fuscous.

Pygofer with lateral margins straight or very shallowly curved, medioventral process moderately large, triangular, arising from middle of an excavation in posterior margin. Anal segment long, bilaterally symmetrical, strongly decurved in distal half, which in dorsal view convexly tapers to an acute apex; anal foramen nearer to base than to apex; in profile lateroventral margins concave, produced ventrad near middle in a triangular spinose process; a minute median spine at apex of segment directed ventrad.

Aedeagus with phallobase in form of a vertical plate, in dorsal view with a rounded lobe on right upper margin near middle, directed to right and bearing a short spine directed anterodorsad, on left side at apex a pair of large bifurcate spines arising from same base, each with the longer limb curved anteroventrad, then anterodorsad; in profile a deep emargination in margin at apex. Genital styles in profile with a small shallow eminence on ventral margin near middle, curved upward through 60 degrees and slightly expanded in distal half, rounded apically and with a small subangulate flange on inner margin. Third valvulae of ovipositor about four-fifths as long as post-tibiae; the expanded

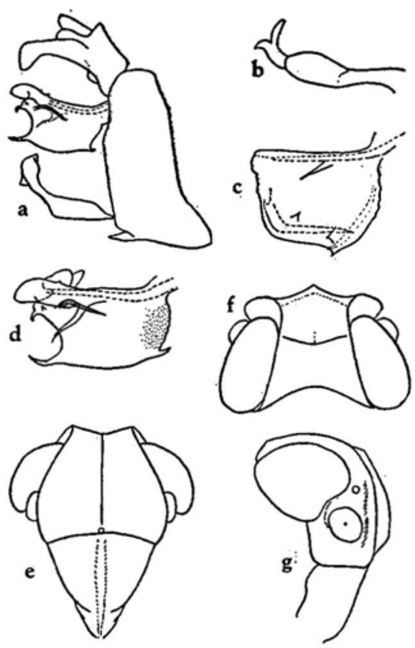


FIGURE 3.—**a, d,** *Myndus polyctor: a,* male genitalia; *d,* aedeagus. **b, c,** *M. bifurcatus: b,* genital style; *c,* aedeagus. **e-g,** *M. dibaphus: e,* frons and clypeus; *f,* vertex; *g,* head in profile.

bases of the first valvulae, viewed from below, separated by a triangular furrow, narrowest distad; lateral pieces of eighth abdominal segment with surface slightly depressed near mesal margin.

Male: length 2.5 mm., tegmen 3.2 mm.; *female:* length 3.2 mm., tegmen 3.5 mm.

Holotype male (US 62112), Guam, Pilgo River, May 26, 1945, G. Bohart and Gressitt. Guam, 17 males and 43 females: Pt. Oca, near Agana, May 1945, Bohart and Gressitt, May and June, Dybas; Pilgo River, May 26, 1945, Bohart and Gressitt; Pago, May 1945, Bohart and Gressitt; 1 mile southeast of Asan, 180-250 m., Oct. 1947, Dybas; Mt. Santa Rosa, June 1945, Bohart and Gressitt; Yigo, Aug. 1938, Oakley; Mt. Lamlam, 400 m., Nov. 1952, Gressitt; Fadang, May 1945, Dybas; Piti Pt., 1 mile south, June 1945, Dybas.

CAROLINE ATOLLS. ELATO: One male, Elato I., Feb. 1953, Beardsley.

DISTRIBUTION: Southern Mariana Is., Caroline atolls.

This species is distinguished by the shape of the vertex and by the structure of the male genitalia. The differences in the male genitalia between all the species of *Myndus* discussed here are too numerous for formal descriptive comparison. However, the figures provide the data by which recognition can most readily be achieved. In some species the shape of the vertex is of diagnostic value, as also, within limits, is the coloration, especially of the tegmina. Even so, it may prove very difficult to assign some female specimens to their correct species.

5. **Myndus dibaphus** Fennah, n. sp. (figs. 2, *b;* 3, *e-g;* 9, *a-d*).

Myndus seminiger, Swezey, 1946, B. P. Bishop Mus., Bull. **189**: 150.

Vertex shorter in middle line than broad at level of midpoint of posterior margin (0.96: 1). Median carina of frons prominently salient in profile; basal margin of frons in anterior view very weakly angulately excavate.

Dark castaneous; thoracic pleurites, femora and abdominal ventrites anteriorly more or less sordidly infuscate; antennae, rostrum, trochanters, tibiae and tarsi, and abdominal ventrites along hind margin pallid stramineous. Tegmina uniformly dark castaneous from base to nodal line, thence abruptly hyaline, veins concolorous. Wings basally lightly infumed, with dark fuscous veins, apically hyaline with pallid veins, the transition in color being at same level as in tegmina when wings are folded.

Third valvulae of ovipositor about four-fifths as long as hind tibiae; the expanded bases of the first valvulae, viewed from below, separated by a parallel-sided furrow; lateral pieces of eighth abdominal segment slightly tumid with margin convex, surface smooth, not at all depressed.

Male: length 2.3 mm., tegmen 2.9 mm.; *female:* length 2.2 mm., tegmen 3.1 mm.

Holotype, female (US 62110), Pt. Ritidian, Guam, June 2, 1945, G. Bohart and Gressitt; allotype, male, Yigo, Guam, July 1, 1938, Oakley. Guam, 13 males, 19 females, and three mutilated specimens: Pt. Ritidian, May 1945, June 2, 1945, Bohart and Gressitt, Oct. 1952, Krauss; Yigo, July 1938, Oakley, on *Pandanus tectorius;* Mt. Santa Rosa, May 1936, on *Pandanus,* Swezey, June 1945, Bohart and Gressitt; Pt. Oca, May 1945, Dybas, June and July 1945, Bohart and Gressitt; Potts Junction, Oct. 1952, Krauss. Agiguan: One male, June 1952, Kondo.

TRUK. Six males and seven females. TON: Mt. Unibot, May 1946, Townes and Oakley; Pata, Sabote-Epin, Apr. 1940, Yasumatsu and Yoshimura. WENA (Moen): July 1946, 180 m., Townes.

DISTRIBUTION: Southern Mariana Is., eastern Caroline Is.

This species is well distinguished by the proportions of the vertex and frons, as shown in the figures, whereas the female genitalia are distinguished (except in the length of the third valvulae) by the characters given. The coloration resembles that of *M. seminiger* Muir (from Samoa) but differs in that the clypeus of the present species is wholly dark fuscous, whereas that of *M. seminiger* is white in its apical half.

6. **Myndus polyctor** Fennah, n. sp. (figs. 2, *e;* 3, *a, d;* 8, *a-c*).

Vertex longer in middle line than broad at level of midpoint of posterior margin (1.25:1). Median carina of frons moderately salient in profile, basal margin of frons in anterior view weakly angulately excavate.

Stramineous; vertex, pronotum behind eyes, and mesonotum yellowish testaceous. Tegmina hyaline with a thin grayish stramineous waxy coating; apical margin and apical veins distad of subapical cross veins fuscous, veins otherwise stramineous. Wings hyaline with brown veins.

Pygofer with lateral margins straight except just above middle, where they are produced in a shallowly convex lobe, ventral margin abruptly excavate with lateral angles of excavation subacute; medioventral process rather large, turbinate-triangular. Anal segment moderately long, strongly decurved in distal half, anal foramen slightly basad of middle, lateral margins weakly converging distally, apical margin transverse, a shallow groove in middle line distad of anal foramen, deepest near apical margin, in profile lateroventral margins strongly concave, a shallow lobe near base arising slightly to right of middle line: this small lobe is the only structure which is not congruent with the bilateral symmetry of the anal segment. Aedeagus comprising (1) a subhorizontal spatulate lobe arising from dorsal margin on right and bearing a stout spine directed lateroventrad at its base and (2) a deep vertical plate, minutely denticulate in its basal quarter, bearing a pair of short stout divergent spines on ventral margin about one-fifth from base, a stout spine directed caudad at distal end of ventral margin, apical margin of plate above this spine broadly concave, with two short spines near its upper end, one spine directed to left and the other to right; arising on left side near upper end of apical margin a long stout spine directed laterad, then curved anteroventrad. Genital styles of subequal width throughout, in posterior view rather weakly convergent dorsad with inner margin produced in a shallow convex lobe near base and abruptly, though obtusely, angulate distally, apical margin oblique, apex bluntly rounded: in profile styles weakly bent dorsad near middle and distinctly constricted just distad of middle.

Male: length 2.1 mm., tegmen 2.5 mm.; *female:* length 2.4 mm., tegmen 2.8 mm.

Holotype, male (US 62112), Pilgo River., Guam, May 26, 1945, G. Bohart and Gressitt. Guam: One male and one female, same data as for type, and Pt. Oca, June 5, 1945, Dybas.

DISTRIBUTION: Southern Mariana Is. (Guam).

Superficially, this species is not unlike *M. bifurcatus,* but it differs from it, as from all other species, in the proportions of the vertex, in the color pattern of the tegmina, and in the shape of the anal segment and of the male genitalia.

7. Myndus marginatus (Metcalf), new comb. (figs. 2, *c;* 4, *c-e;* 11, *a-c*).

Myndorus marginatus Metcalf, 1954, Elisha Mitchell Sci. Soc., Jour. **70** (1) : 5.

Vertex longer in middle line than broad at level of midpoint of posterior margin (nearly 1.3 : 1). Median carina of frons scarcely salient in profile, basal margin of frons in anterior view weakly angulately excavate.

Testaceous; legs and abdominal ventrites stramineous; antennae faintly, abdominal tergites except laterally and distally, basal median part of male anal segment and anal

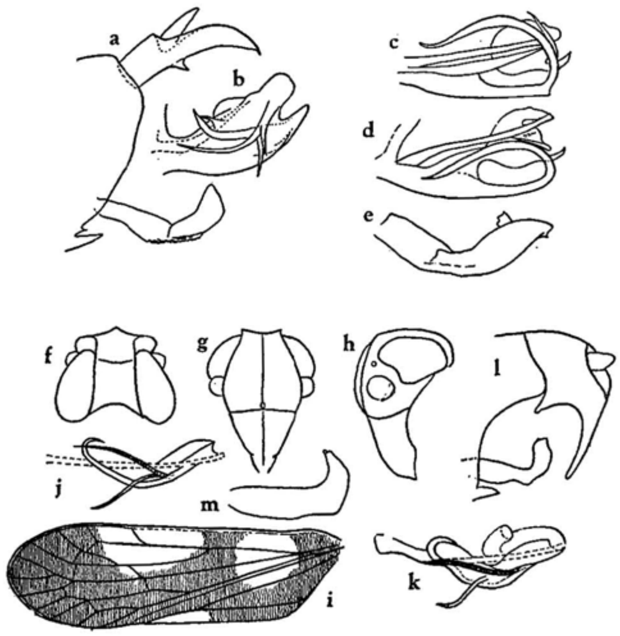


FIGURE 4.—**a, b,** *Myndus nearchus: a,* anal segment, pygofer, and genital style; *b,* aedeagus. **c-e,** *M. marginatus: c,* aedeagus, ventrolateral view; *d,* aedeagus, lateral view; *e,* genital style. **f-m,** *M. orion: f,* vertex; *g,* frons and clypeus; *h,* head in profile; *i,* tegmen; *j,* aedeagus, ventrolateral view; *k,* aedeagus, lateral view; *l,* anal segment, margin of pygofer, and genital style; *m,* genital style.

style fuscous, abdomen laterally tinged orange. Tegmina hyaline, tinged sordid yellow, stigma, apical margin narrowly, commissural margin rather broadly, fuscous. Veins concolorous except near apical margin, where they are infuscate. Wings hyaline with apical margin and veins dark.

Pygofer with lateral margins slightly sinuate, ventral margin excavate, medioventral process moderately large, subtriangular, with apex broadly rounded, sometimes with a small spine. Anal segment of male short, rather broad, asymmetrical, strongly ventrally produced, on left side lateroapically in a triangular lobe and on right side in a similar though shorter lobe, broadly angulate apically, between these lobes apical margin subacutely excavate; anal foramen situated close to base. Aedeagus rather slender, approximately tubular, with six spinose processes, as follows: an exceptionally large spinelike process arising on left at base, directed caudad in its basal half, giving off a porrect spine,

then broadly curved laterodorsad, then cephalad, and finally slightly recurved at apex, main axis of aedeagus with two spines on left at apex, arising almost at same point, one slender, directed laterodorsad, the other shorter, stouter, directed caudad and slightly curved upward. On right ventrally near apex a very slender short curved spine directed caudad. A short spine dorsally in middle. Flagellum moderately short, pellucid, membranous. Genital styles of approximately equal width throughout, curved upward in distal half, apical angles moderately and unequally produced.

Expanded bases of first valvulae separated by a triangular sulcus, narrowest at its apex.

Male: length 2.8 mm., tegmen 3.5 mm.; *female:* length, 3.0 mm., tegmen 3.5 mm.

DISTRIBUTION: Eastern Caroline Is.

PONAPE. Twenty-five males, 20 females, and two mutilated specimens. Nanpil, Nett District, Feb. 1948, Dybas; Nampir, Sankakuyama, Jan. 1938, Esaki; north slope, Mt. Kupuriso, 300-450 m., Mar. 1948, Dybas; summit, Mar. 1948, Dybas; Mt. Temwetemwensekir, 150-420 m., Feb. 1948, Dybas, June-Sept. 1950, Adams; Tolotom, 630 m., Mt. Tolenkiup, June-Sept. 1950, Adams; Mt. Dolennankap, 540 m., Aug. 1946, Townes; Mt. Beirut, Aug. 1950, Adams; Mt. Nanalaud, 300 m., Mar. 1948, Dybas, Jan. 1938, Esaki; Nipit-Ninoani, Jan. 1938, Esaki; One-Nipit, July 1939, Esaki; Sokehs (Jokaj) I., 1 m., Jan. 1953, Gressitt.

8. **Myndus irreptor** Fennah, n. sp. (fig. 5, *a-h*).

Vertex longer in middle line than broad at level of midpoint of posterior margin (1.1:1). Median carina of frons not salient in profile, basal margin of frons in anterior view transverse.

Stramineous. Tegmina grayish hyaline, veins stramineous, a spot overlying each apical vein at margin, fuscous. Wings hyaline, powdered grayish white.

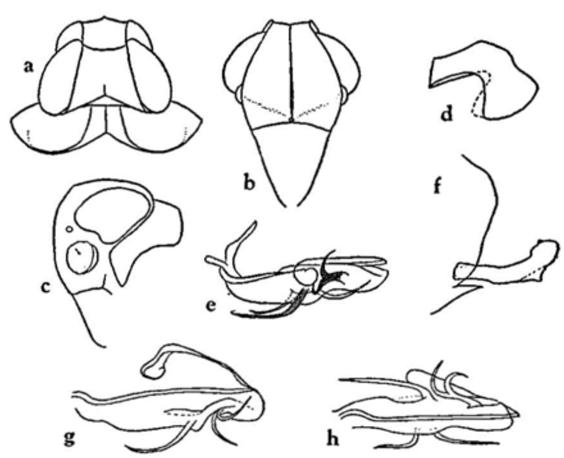


FIGURE 5.—*Myndus irreptor:* **a**, vertex and pronotum; **b**, frons and clypeus; **c**, head in profile; **d**, anal segment of male; **e**, aedeagus; **f**, pygofer and genital style; **g**, aedeagus, laterodorsal view; **h**, aedeagus, ventral view.

Pygofer moderately long, lateral margins very broadly produced in a convex-obtusely angulate lobe, medioventral process moderately long, subtriangular. Anal segment of male rather short, not quite bilaterally symmetrical, with deep sides, ventral margins rectangulately bent ventrad at middle, lateroapical angles deeply rounded, apical margin deeply excavate. Aedeagus relatively narrow, subtubular, porrect caudad: on right side at middle a shallow eminence bearing two long stout spinose processes, one directed cephalad, the other caudad: on left side at middle a long spinose process directed ventrad and curving cephalad and extending almost to base of aedeagus; midway between base of this process and apex of aedeagus a stout deeply bifurcate process with both limbs curved dorsad distally; flagellum whiplike, long and very slender. Genital styles moderately long, of subequal width throughout basal half, slightly widened and bent dorsad through 45 degrees distally, subangulate at point of flexure, a small process on upper margin near apex.

Male: length 2.4 mm., tegmen 2.5 mm.

Holotype, male (CM), Pt. Oca, Guam, June 2, 1945, Dybas. Guam: Eleven males and one female, Pt. Oca, June 1945, Dybas, July 1945, Bohart and Gressitt; Fadang, on *Pandanus* leaf, June 1945, Dybas. Tinian: Two males and one female; Marpo Valley, Apr., Oct. 1945, Dybas.

DISTRIBUTION: Southern Mariana Is. (Guam, Tinian).

This species is nearest to pale specimens of *M. nearchus* in general appearance and is not unlike *M. polyctor*. From both, however, it differs profoundly in the structure of the male genitalia.

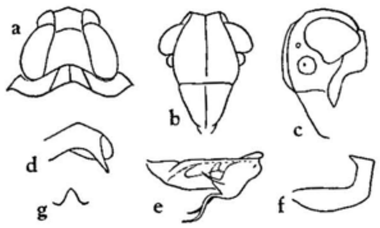


FIGURE 6.—*Myndus praecanus:* **a**, vertex and pronotum; **b**, frons and clypeus; **c**, head in profile; **d**, anal segment of male; **e**, aedeagus; **f**, genital style; **g**, medioventral process of pygofer.

9. **Myndus praecanus** Fennah, n. sp. (fig. 6, *a-g*).

Vertex longer in middle line than broad at level of midpoint of posterior margin (nearly 1.2: 1). Median carina of frons moderately salient in profile, basal margin of frons in anterior view slightly excavate.

Pale stramineous; frons, vertex, and mesonotum more distinctly yellowish. Tegmina grayish hyaline, marked as in *M. nearchus* (fig. 4, *a, b*) with very faint yellow, a linear mark on margin at claval apex fuscous. Wings hyaline, powdered grayish white. Female with fuscous marking on middle of disc of frons and clypeus, on margins of vertex above eyes, on pronotum behind eyes, on mesonotum, pleurites and femora; abdomen dark fuscous. Tegmina similarly but more heavily marked than in male with the submedial oblique stripe fuscous, margined yellowish. Wings hyaline with apical margin narrowly fuscous.

Pygofer moderately long with dorsolateral angles only very slightly produced, lateral margins shallowly convex, almost straight, medioventral process broadly triangular. Anal segment of male short, asymmetrical, anal foramen at middle, lateroapical angle of left side strongly produced ventrad in a narrow, fingerlike lobe, the corresponding angle on

right side very broadly and obtusely produced. Aedeagus narrow; seminal duct porrect caudad as a narrow sclerotized rod; below this a sinuate vertical lobe bearing a rather short spine on right side at middle, directed cephalad, and a pair of subequal sinuate spines on ventral margin just distad of middle; flagellar portion apparently represented by a delicate, pellucid triangular lobe overhanging left side near apex. Genital styles L-shaped, of subequal width throughout basal portion, rectangulately bent just distad of middle, obliquely truncate at apex with inner angle slightly produced and acute, a ridge traversing inner face of distal part of style diagonally.

Male: length 2.9 mm., tegmen 3.5 mm.; *female:* length 3.0 mm., tegmen 3.5 mm.

Holotype, male (US 62115), Ponape, Mt. Temwetemwensekir, Feb. 29, 1948, Dybas. Ponape, 24 males, 30 females, and one mutilated specimen: Mt. Temwetemwensekir, 150-300 m., Feb. 29, 1948, Dybas, June-Sept. 1950, Adams; Nanpil, Nett District, Feb. 1948, Dybas; Mt. Kupuriso, 300-450 m., Nov. 1948, Dybas, June-Sept. 1950, Adams; Mt. Nanalaud, 300 m., Mar. 1948, Dybas; Mt. Beirut, and Peipalap Pk., both June-Sept. 1950, Adams; Matalanim, Aug. 1949, Oakley; Mt. Dolennankap, 510-570 m., Aug. 1946, Townes; Hydroelectric Plant, Colonia, Aug. 1946, Townes; Nipit, July 1939, Esaki; Ronkiti-One, July 1939, Esaki.

MARSHALL IS. JALUIT: Three males and six females, Medyado I., Aug. 1946, Townes; Sydney Pier, Aug. 1946, Oakley; Imrodj, Aug. 1946, Oakley.

DISTRIBUTION: Eastern Caroline Is. (Ponape), Marshall Is.

This species generally resembles *M. marginatus,* but the distal margin never seems to be infuscate in the same manner. The two species may readily be separated by the shape of the male genitalia.

10. **Myndus orion** Fennah, n. sp. (fig. 4, *f-m*).

Vertex longer in middle line than broad at level of midpoint of posterior margin (nearly 1.5:1). Median carina of frons feebly salient in profile, basal margin of frons in anterior view very weakly angulately excavate.

Castaneous; a spot on each side above eyes testaceous, thoracic pleurites and femora fuscous, tibiae and tarsi pallid stramineous. Tegmina hyaline, a suffusion at base, a spot between posterior claval vein and hind margin at level of middle of clavus, an oblique fascia, growing broader caudad, from costal margin just basad of middle to apex of clavus and overlying apical part of clavus, subapical cells of Cu_1 and all apical cells fuscous. Wings lightly suffused fuscous, paler in region of node, veins dark. Pale form: testaceous stramineous, tegmina hyaline, faintly suffused with yellow corresponding to fuscous marks of dark form.

Pygofer moderately long, with left dorsolateral part of posterior margin produced caudad in a parabolic lobe which is also produced mesad on its inner face; the corresponding area on the right margin very little produced caudad, but directed mesad in a short conical process; medioventral process as long as broad with sides rounded, a minute slender spine at apex. Anal segment short asymmetrical, anal foramen in basal third, left lower margin triangularly produced ventrad, apically with a small knoblike process, right lower margin at apex strongly produced ventrad in a quadrate lobe with its apical margin oblique. Aedeagus moderately narrow, phallobase subtubular and slightly curved dorsad distally, a stout hooklike spinose process arising ventrally one-third from base, directed cephalad and lying close against ventral surface, curved to left apically; distad of the base of this process, on right side ventrally, a moderately long and rather slender sinuate spine directed ventrocephalad; on left at apex a third spinose process shallowly sinuate

and directed cephalad; flagellum rather short, distally bluntly rounded. Genital styles rather short, in posterior view clublike, in profile of subequal width throughout basal half then slightly expanded, abruptly bent dorsad and tapering at apex, inner margin near point of flexure with a minutely denticulate lobe.

Male: length 2.2 mm., tegmen 2.9 mm.; *female:* length 2.9 mm., tegmen 3.8 mm.

Holotype, male (US 62114), Ponape, Mt. Beirut, June-Sept. 1950, Adams. Paratype, male (US), Mt. Temwetemwensekir, Feb. 1948, Dybas. Ponape, 24 males and 19 females: Mt. Beirut, June-Sept. 1950, Adams; Mt. Pairot, 600 m., Mar. 1948, Dybas; Nanpil, Nett District, Feb. 1948, Dybas; Mt. Kupuriso, 300-450 m., Mar. 1948; summit, 600 m., Mar. 1948, both by Dybas; Mt. Tem-

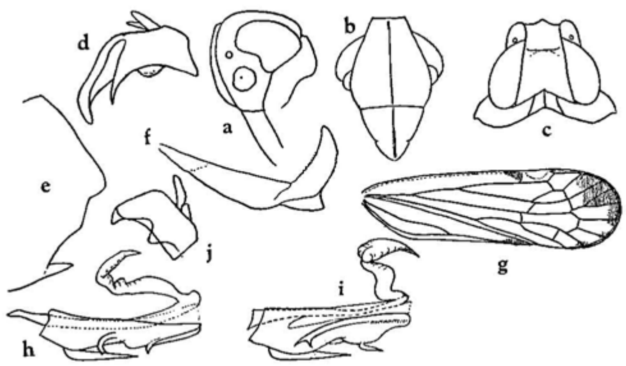


FIGURE 7.—**a-h,** *Myndus oxalme: a,* head in profile; *b,* frons and clypeus; *c,* vertex and pronotum; *d,* anal segment of male; *e,* pygofer; *f,* genital style; *g,* tegmen; *h,* aedeagus (specimen from Moen, Truk). **i, j,** *M. o. namanus: i,* aedeagus; *j,* anal segment of male.

wetemwensekir, 150-300 m., Feb. 1948, Dybas, June-Sept. 1950, Adams; Mt. Nanalaud, 60 m., Mar. 1948, Dybas, June-Sept. 1950, Adams; Peipalap Peak, 240 m., June-Sept. 1950, Adams; Mt. Dolennankap, 510-570 m., Aug. 1946, Townes; Palang, west coast, 15 m., Jan. 1953, Gressitt; Kolonia-Nampir-San-kakuyama, Jan. 1938, Esaki.

DISTRIBUTION: Eastern Caroline Is. (Ponape).

This species is distinguished by the tegminal markings and by the shape of the anal segment of the male and the male genitalia. Some of both color forms bear the same locality label.

11. **Myndus oxalme** Fennah, n. sp. (figs. 7, *a-h;* 10, *e-i*).

Vertex longer in middle line than broad at level of midpoint of posterior margin (nearly 1.3:1). Median carina of frons moderately salient in profile, basal margin of frons in anterior view transverse.

Testaceous; thoracic pleurites and legs stramineous. Tegmina hyaline, faintly bloomed with gray, a linear spot on margin at apex of clavus, veins of Cu_1 at apical margin, a suffusion across apical cells of R and M, and a spot in stigma fuscous, sometimes also a rather narrow fuscous fascia from costal margin near middle to apex of clavus.

Pygofer moderately long with dorsolateral angles shallowly produced in a broad con-

vex lobe, ventral margin excavate, with lateral angles of excavation subacute, medioventral process parabolic, rather longer than broad. Anal segment of male short, asymmetrical, anal foramen in basal third, on left side distally produced in a long subtriangular lobe directed ventrad, acutely rounded at its apex; on right side produced in a relatively narrow process, directed ventrad and slightly mesad, almost spinelike at apex. Aedeagus narrow, more or less tubular, a stout spine arising ventrally one-fifth from base, directed caudad, a smaller spine arising on right near middle of aedeagus, directed cephalad then recurved ventrad and caudad minutely bicuspidate at apex; a third spine arising at apex directed cephalad below aedeagus then curving to left: flagellum pellucid, membranous, acute at apex, about as long as sclerotized part of aedeagus. Genital styles rather short, L-shaped, basal portion with dorsal and ventral margins slightly convex in profile, distal portion widest at point of flexure, tapering distally and slightly curved, a shallow angulate projection at point of flexure.

Male: length 2.8 mm., tegmen 3.1 mm.; *female:* length 3.0 mm., tegmen 3.2 mm.

Holotype, male (US 63139), allotype female (US), both from Nantaku (Civil Administration area), Wena (Moen), Truk, Feb. 1949, Potts. Truk, nine males and 10 females: Moen, Civil Administration area, Feb. 10, 11 and

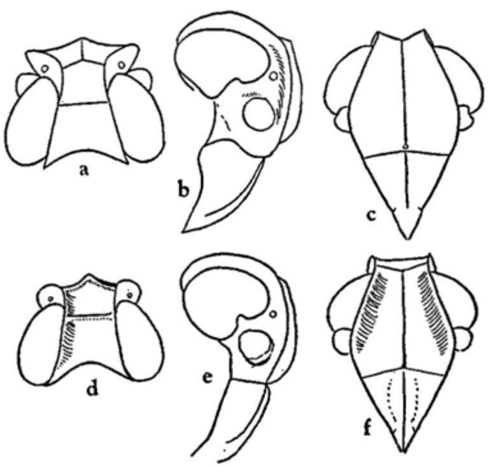


FIGURE 8.—**a-c,** *Myndus polyctor: a,* vertex; *b,* head in profile; *c,* frons and clypeus. **d-f,** *M. bifurcatus: d,* vertex; *e,* head in profile; *f,* frons and clypeus.

Apr. 1, 27, 1949, Potts, Oct. 1952, Beardsley; Tol I., Mt. Unibot, May 1946, Townes; Wela, July 1939, Esaki; Pata, Sabote-Epin, Apr. 1940, Yasumatsu and Yoshimura; Toloas, Kutua, July 1939, Esaki; Dublon, Oct. 1952, Beardsley.

CAROLINE ATOLLS. SATAWAL: One male and one female, Sept. 1952, Krauss. IFALUK: One male, Sept. 1952, Krauss. LAMOTREK: One male and two females, Sept. 1952, Krauss; Feb. 1953, Beardsley. NOMWIN: Two males and one female, Fananu I., Nomwin I., both Feb. 1954, Beardsley.

DISTRIBUTION: Central Caroline Is. (Truk, Caroline atolls).

This species superficially resembles a lightly marked form of the Guam *M. nearchus,* but differs profoundly in the male genitalia.

12. **Myndus oxalme namanus** Fennah, n. subsp. (fig. *7, i, j*).

Sordid stramineous or testaceous: tegmina hyaline, tinged yellow, with apical veinlets fuscous at margin, or with fuscous markings as in typical subspecies. Male genitalia as in typical subspecies, with the following differences in the aedeagus: basal ventral spine, which is directed caudad, slightly more slender; apical spine of left side curved dorso-laterad to left, not directly laterad; process in middle of aedeagus on right directed antero-ventrad, not at all recurved, strongly and unequally bifurcate distally.

Male: length 2.4 mm., tegmen 3.0 mm.; *female:* length 3.1 mm., tegmen 3.8 mm.

Holotype, male of subspecies (US 62202), allotype, female (US), Nama, Feb. 15, 1949, R. W. L. Potts. Nama: Two males and one female, Feb. 15, 1949, Potts; Oct. 1952, Beardsley.

DISTRIBUTION: Eastern Caroline Is. (Nama).

The differences in the shape of the genitalia between Truk and Nama samples are very small compared with the genitalic differences between other Micronesian populations of *Myndus*. Such a degree of proximity is best expressed taxonomically by recognizing the Nama population as distinct from the Truk population only at subspecific level and accepting the implication that, if opportunity of pairing were afforded, no reproductive isolation would exist.

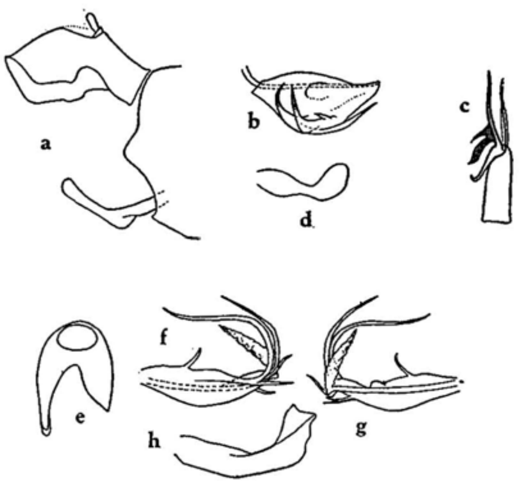


FIGURE 9.—**a-d,** *Myndus dibaphus: a,* anal segment, posterior margin of pygofer, and genital style, right side; *b,* aedeagus, left side; *c,* aedeagus, ventral view; *d,* genital style, ventral view. **e-h,** *M. niger: e,* anal segment of male, posterior view; *f,* aedeagus, left side; *g,* aedeagus, right side; *h,* genital style, lateral view.

13. **Myndus niger** (Metcalf), new comb. (figs. 2, *f;* 9, *e-h;* 11, *d-f*).

Myndorus niger Metcalf, 1954, Elisha Mitchell Sci. Soc., Jour. **70** (1) : 6.

Vertex as long in middle line as broad at midpoint of posterior margin.

Castaneous, thinly bloomed gray with wax; thoracic pleurites, femora, and abdominal ventrites lightly suffused fuscous; tibiae and tarsi stramineous; abdomen laterally orange.

Tegmina with corium hyaline, suffused sordid yellow, distad of nodal line and along commissural margin fuscous; veins in corium dull yellow, except Cu_2 and claval veins which are fuscous. Wings basally hyaline with subhyaline veins, distally fuscous with fuscous veins, the transition occurring at same level as in tegmina when wings are folded.

Anal segment with left margin more deeply produced ventrad than right, apical margin deeply excavate. Pygofer with lateral margins shallowly sinuate, medioventral process subtriangular, apically rounded and bearing a blunt median tooth. Aedeagus with a spine at middle of dorsal margin, a forked spine on left, with one limb short, porrect caudad, the other long, widely recurved cephalad, a short spine on right at apex, subventrally, directed caudad, a further short spine arising at apex of aedeagus directed dorsocaudad and a long spine arising near the same point directed dorsad and obliquely cephalad. Flagellum elongate-conical tapering to apex. Genital styles of subequal width throughout in side view, apically slightly twisted, apical margin concave-truncate.

Male: length 2.8 mm., tegmen 3.5 mm.; *female:* length 3.0 mm., tegmen 3.5 mm.

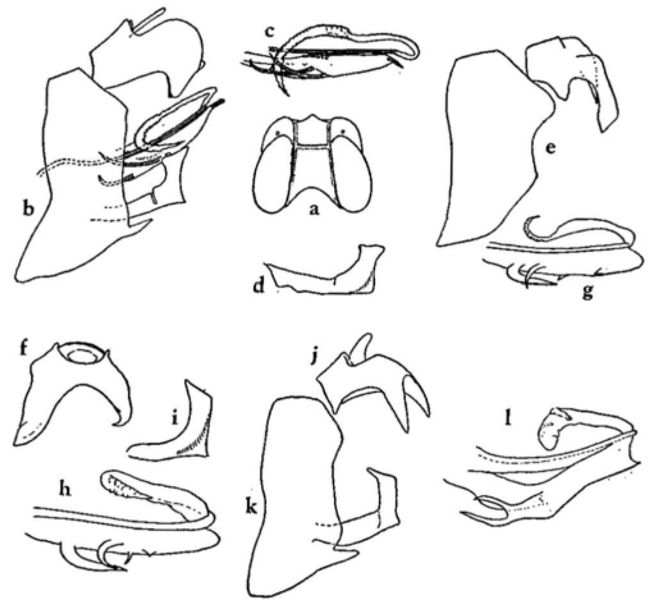


FIGURE 10.—**a-d**, *Myndus aphrodite: a,* vertex; *b,* male genitalia, left side; *c,* aedeagus, laterodorsal view on left; *d,* left genital style. **e-i**, *M. oxalme: e,* anal segment and pygofer, left side; *f,* anal segment, posterior view; *g,* aedeagus, left side (material from Tonoas, Truk); *h,* aedeagus, left side, not to same scale as *g* (material from Ifaluk); *i,* left genital style. **j-l**, *M. uniformis: j,* anal segment, left side; *k,* pygofer and left genital style; *l,* aedeagus, left side.

DISTRIBUTION: Eastern Caroline Is.

PONAPE. Nineteen males and 15 females: North slope, Mt. Kupuriso, 300-450 m., Mar. 1948, Dybas; Mt. Temwetemwensekir, 150-420 m., Feb. 1948, Dybas; Mt. Beirut, Aug. 1950, Adams; Mt. Dolennankap, 540 m., Aug. 1946, Townes; Mt. Nanalaud, 300 m., Mar. 1948, Dybas.

The capitate spine described and figured in the original description is the sclerotized duct leading to the base of the flagellum in my figure 9, *g*.

14. Myndus orestes Fennah, n. sp. (fig. 11, *g-l*).

Vertex a little longer in middle line than broad across base.

Testaceous; legs and lower side of body stramineous; dorsal surface of abdomen and post-femora infuscate. Tegmina hyaline, distinctly suffused yellow, posterior margin of clavus in distal half and membrane fuscous. Wings infuscate.

Anal segment moderately short, distally excavate. Pygofer with laterodorsal angles slightly produced, obtuse, rounded; medioventral process subtriangular, distally rounded. Aedeagus tubular; a pair of contiguous spinose processes of equal length on left near apex directed dorsocephalad, slightly mesad of base of these a short spinose process directed caudad; on right side ventrally at same level a short slender spinose process directed laterocaudad. Genital styles moderately narrow, subparallel-sided, curved upward distally, truncate at apex.

Male: length 2.9 mm., tegmen 3.9 mm.

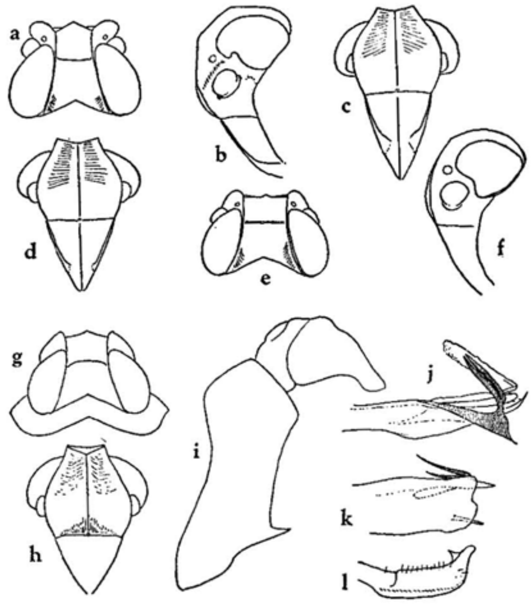


FIGURE 11.—**a-c**, *Myndus marginatus: a,* vertex; *b,* head in profile; *c,* frons and clypeus. **d-f**, *M. niger: d,* frons and clypeus; *e,* vertex; *f,* head in profile. **g-l**, *M. orestes: g,* vertex and pronotum; *h,* frons and clypeus; *i,* anal segment and pygofer, left side; *j,* aedeagus, left side; *k,* aedeagus, ventral view; *l,* left genital style.

Holotype, male (US 62116), Ponape, summit, Mt. Kupuriso, alt. about 600 m., Mar. 8, 1946, Dybas.

DISTRIBUTION: Eastern Caroline Is. (Ponape).

In coloration of tegmina this species resembles *M. niger* but differs from it, as from all others, in the form of the aedeagal armature.

15. Myndus ophiuchus Fennah, n. sp. (fig. 12, *a-f*).

Vertex in middle line longer than broad across base.

Stramineous, basal half of disc of frons coarsely and heavily mottled piceous. Tegmina hyaline with yellowish tinge faintly marked fuscous from stigma along subapical cross veins; in female marked fuscous as in *M. oxalme*.

Anal segment of male asymmetrical in posterior view, lateroapical angles produced, that on right side longer and less acute at apex than that on left. Pygofer with laterodorsal angles strongly produced caudad, deeply convex; medioventral process subtriangular, distally rounded. Aedeagus tubular, a short sinuate spinose process dorsally near base directed dorsocaudad, a longer and stouter spinose process ventrally in middle line, directed cephalad to near base of aedeagus, then strongly recurved caudad, forming a deep U-shaped loop; on left side near apex a moderately long spinose process directed ventrocephalad, then curved dorsocephalad. Genital styles more or less parallel-sided in basal two-thirds, distally curved dorsad and subacute at apex.

Male: length 2.8 mm., tegmen 3.8 mm.; *female:* length 3.9 mm., tegmen 4.1 mm.

Holotype, male (US 62117), Malem, 1 m., Kusaie, Mar. 1, 1953; allotype, Mt. Matante, 380 m., Mar. 4, 1953; Pukusrik, 1 m., Feb. 13, 1953, all by J. F. G. Clarke.

DISTRIBUTION: Eastern Caroline Is. (Kusaie).

16. Myndus uniformis (Metcalf), new comb. (fig. 10, *j-l*).

Myndorus uniformis Metcalf, 1954, Elisha Mitchell Sci. Soc., Jour. **70** (1):6.

Vertex slightly wider across base than long in middle line.

Stramineous. Tegmina hyaline, with yellow tinge, apical veinlets of R and M lightly overlain with fuscous at margin.

Anal segment of male slightly asymmetrical in posterior view, both laterodistal angles much produced and tapering to acute apex. Pygofer with laterodorsal angles not or very feebly produced, medioventral process triangular. Aedeagus tubular, a pair of rather short stout spinose processes on left side near base directed cephalad. Genital styles in side view almost parallel-sided in basal half, abruptly bent dorsad at middle and obliquely truncate at apex.

Male: length 2.8 mm., tegmen 3.5 mm.

DISTRIBUTION: Eastern Caroline Is.

PONAPE. Three males: Mt. Kupuriso, summit, about 600 m., Mar. 8, 1948, Dybas; Colonia, Sankakuyama, July 1939; Jokaji, July 1939, both by Esaki.

This species is distinguished by the shape of the vertex and that of the aedeagus and by coloration.

17. Myndus aphrodite Fennah, n. sp. (fig. 10, *a-d*).

Vertex more than 1.4 times as long in middle line as wide at level of midpoint of posterior margin.

Yellow or ochraceous; posterior compartment of vertex, pronotum, and mesoscutellum pallid; femora at base and apex, tibiae and tarsi pallid or stramineous; a faint suffusion on frons, a heavier suffusion on clypeus, pleurites, femora except at extremities, and abdomen except laterally ochraceous fuscous. Tegmina yellowish hyaline, incompletely banded

obliquely twice on corium with sordid yellow or fuscous, apical cells fuscous to fuliginous, veins concolorous, fuscous in corium, where crossed by yellow bands; stigma opaque, polished, ochraceous in basal half, almost piceous in distal half. Wings hyaline, tinged fuscous distally, veins fuscous.

Anal segment of male deeply hoodlike, strongly deflexed distad of anal foramen, lateroapical angles strongly produced, rounded on left, subrectangulate on right. Pygofer with laterodorsal angles obtusely produced, medioventral process subtriangular. Aedeagus laterally compressed, a short spinose process arising near middle of right side, directed cephalad, two longer and stouter spinose processes arising near middle ventrolaterally on left side, directed cephalad, one weakly, the other strongly curved dorsad distally. Genital styles moderately narrow, abruptly bent dorsad through 70 degrees near middle, truncate apically with two minute cusps.

Male: length 2.9 mm., tegmen 3.9 mm.; *female:* length 3.5 mm., tegmen 4.0 mm.

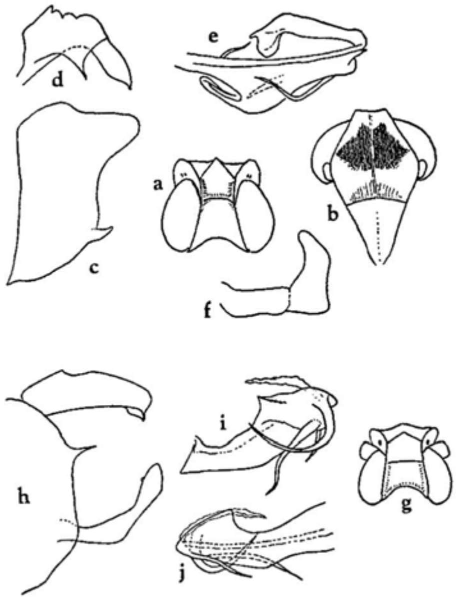


FIGURE 12.—**a-f**, *Myndus ophiuchus: a,* vertex; *b,* frons and clypeus; *c,* pygofer, left side; *d,* anal segment, left side; *e,* aedeagus, left side; *f,* left genital style. **g-j**, *M. cressida: g,* vertex; *h,* anal segment, pygofer, and genital style, left side; *i, aedeagus,* left side; *j,* aedeagus, right side.

Holotype, male (US 62108), Kusaie, Lele I., Aug. 1946, Oakley. Kusaie, nine males, seven females, and one mutilated specimen: Lele I., on *Cocos nucifera,* Aug. 19, 1946, Oakley; 100 m., Mar. 1953, Clarke; "Hill 1010," 300 m., Feb. 1953, Clarke; Mutunlik, 22 m., Jan. 1953, Clarke; Malem, 1 m., Mar. 1953, Clarke, Dec. 1937, Esaki.

MARSHALL IS. JALUIT: Five males and three females; Imrodj, Aug. 1946, Oakley; Imej, Nov. 1937, Esaki; Elizabeth, Sept. 1953, Beardsley.

DISTRIBUTION: Eastern Caroline Is. (Kusaie), Marshall Is.

This species is distinguished by the shape of the vertex, to some extent by its coloration, and by the structure of the male genitalia. In the latter respect it is nearest to *M. uniformis,* though it differs markedly in the shape of every element involved.

18. Myndus cressida Fennah, n. sp. (fig. 12, *g-j*).

Vertex as broad across base as long in middle line.

Testaceous; disc of frons and clypeus except in middle line, pronotum behind eyes, mesocoxae, and abdomen fuscous. Tegmina hyaline, with an oblique band across basal fifth, a second band across middle to apex of clavus, subapical line of cross veins and cell M_3, yellowish brown. Wings hyaline with veins brown.

Anal segment of male moderately long, in profile only very slightly deflexed in distal half, acute at apex, which is directed ventrad. Pygofer moderately long with posterior lateral margin produced in a narrow acuminate lobe. Aedeagus tubular, slightly widened distally; laterally on right near apex a short curved spinose process directed ventrad; on left distally a rather long spinose process arising subventrally, directed ventrocephalad, and just distad of it a longer spinose process curved ventrad, then forward and dorsad; a short prominent ridge on dorsal margin one-third from apex, in profile view of aedeagus appearing as an acute eminence; flagellum rather small. Genital styles moderately long, rather narrow, in profile curved upward distally and slightly dilated near apex.

Male: length 3.0 mm., tegmen 3.5 mm.; *female:* length 3.2 mm., tegmen 3.8 mm.

Holotype, male (US 62107) and allotype, female, Agiguan, June 4-6, 1952, Y. Kondo. Saipan: One male and two females, Apr. 1945, Dybas. Tinian: Two males and one female, Marpo Valley, Mar., Oct. 1945, Dybas. Agiguan: Three males, 27 females, and one mutilated specimen, Apr. 1952, Owen, May 28-June 9, 1952, Kondo. Rota: One male, Tatacho-Sonson, Feb. 1936, Esaki.

DISTRIBUTION: Southern Mariana Is.

This species is distinguished by the proportions of the vertex and the shape of the male genitalia.

19. Myndus apicalis (Metcalf), n. comb.

Myndorus apicalis Metcalf, 1954, Elisha Mitchell Sci. Soc., Jour. **70** (1): 4.

DISTRIBUTION: Truk, Woleai (Oleai) Atoll, Ponape, Kusaie, and Jaluit Atoll. Four of these records are based on female material only; the single male was taken on Kusaie.

20. Myndus fusciterminalis (Metcalf), new comb.

Myndorus fusciterminalis Metcalf, 1954, Elisha Mitchell Sci. Soc., Jour. **70** (1): 5.

DISTRIBUTION: Eastern Caroline Is. (Ponape).

21. Myndus spp.

A single mutilated female (MCZ), generally similar to pale females of *M. cressida,* but with a white clypeus, bore the label "Ruul Distr., Yap, July-Aug. 1950, Goss."

As the material was examined in batches over a period of two years, it was not always possible to ascribe female specimens to their species with certainty. This applies especially to those with the general coloration of *M. oxalme*. The origin of this material, with the number of specimens examined shown in parenthesis, is as follows: Yap (2), Ruul District, July-Aug. 1950, Goss; Mt. Gillifitz, 150 m., Dec. 1952, Gressitt. Fais I. (5), Oct. 1952, Krauss. Palau (2), Koror, July 1946, Oakley; Ngaremeskang, 30 m., Dec. 1952, Gressitt. Guam (7), Mt. Alutom, July 1946; Barrigada, June 1936, Usinger; Santa Rosa, Mar. 1936, Pt. Ritidian, Aug. 1945, Gressitt, Oct. 1952, Krauss, June 1945, Bohart and Gressitt. (The Barrigada and Santa Rosa material was referred by Swezey to *M. palawanensis* Muir, but the absence of males of this species from the Micronesian collections virtually proves that this is not the species involved.) Lukunor (1), Nov. 1952, Beardsley. Etal, Etal Atoll, Nov. 1952, Beardsley. Ponape (3), Mt. Temwetemwensekir, 150 m.-300 m., Mar. 1948, Dybas; Mt. Kupuriso, 300 m.-450 m., Mar. 1948, Dybas; Matalanim Plantation, Nov. 1953, Beardsley.

Genus **Euryphlepsia** Muir

Euryphlepsia Muir, 1922, Philippine Jour. Sci. **20**: 114 (orthotype: *Euryphlepsia amboinensis* Muir, loc. cit.).

In 1922 Muir referred this genus to the tribe Oecleini, in which Sc, R, and M unite basally in a common stalk. In 1925 he placed it in the tribe Bothriocerini, as the antennae are sunk into pits. *Euryphlepsia* is probably not far removed from *Myndus*, from which it is separated by the spinose ornamentation of the hind legs and by the aberrant tegminal venation.

The post-tibiae have 11 or 12 teeth in an irregular row on the apical margin, the basal metatarsal joint has 10 even teeth along the distal margin, the second metatarsal joint has about eight teeth in an irregular row on the hind margin. The female genitalia have an ovate wax-bearing area, deeper than wide, between the valvulae and the anal segment.

22. **Euryphlepsia pallescens** (Metcalf), new comb. (fig. 13, *a-g*).

Myndorus pallescens Metcalf, *nom. emend.* for *M. palescens* Metcalf, 1954, Elisha Mitchell Sci. Soc., Jour. **70** (1): 4.

Stramineous to testaceous; legs stramineous, abdomen and genitalia of darker specimens fuscous. Tegmina of male hyaline, suffused stramineous and with anterior subapical cross veins lightly infuscate; of female suffused sordid yellow and pale fuscous on corium, with membrane hyaline, costal cell at apex, a suffusion broadly overlying M just basad of nodal line, subapical cross veins and apical veins at margin fuscous. Wings hyaline with pale-brown veins.

Pygofer rather short, lateral margins shortly angulately produced near middle, ventral margin excavate; medioventral process moderately large, parabolic. Anal segment short with anal foramen at apex, left margin produced ventrad in a broad lobe tapering distally and curved; right margin produced ventrad in a long narrow lobe which is expanded at apex and bears an accessory lobe on its inner face; anal style long, decurved. Aedeagus tubular, a small parabolic lobe on right near base; ventrally, in basal fifth, an oblique subquadrate lobe directed ventrocaudad, terminating in two spines distally, one above the other; two long spines arising together on left at apex of aedeagus directed cephalad, reaching basad just past middle of aedeagus, a shorter sinuate spine arising close to these, directed cephalad; flagellum with a long spine on right and two spines on left, one a third longer than the other. Genital styles narrow in basal two-fifths, then curved dorsad through 35 degrees and abruptly expanded into a subquadrate lobe of which ventral margin in profile is convex and dorsal is shallowly concave; apical margin with a blunt eminence near middle.

Male: length 3.0 mm., tegmen 3.3 mm.; *female:* length 3.2 mm., tegmen 3.5 mm.

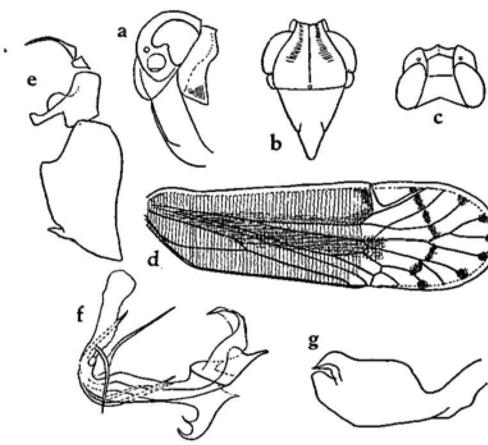


FIGURE 13.—*Euryphlepsia pallescens:* **a**, head in profile; **b**, frons and clypeus; **c**, vertex; **d**, tegmen; **e**, anal segment and pygofer; **f**, aedeagus; **g**, genital style.

DISTRIBUTION: Western Caroline Is.

PALAU. BABELTHUAP: Twenty-four males and 29 females; Ulimang, Dec. 1947, Dybas; Ngiwal, June 1946, Townes; Gakip, July 1946, Oakley; Iwang, 8 m., Dec. 1952, Gressitt; east Ngatpang, 65 m., Dec. 1952, Gressitt; 25 m., Ngaremeskang, Dec. 1952, Gressitt; Ngarard, Aug. 1939, Esaki. KOROR: Forty males and 43 females; Limestone Ridge east of inlet, Aug., Sept., Dec. 1952, May 1953, Beardsley, Nov. 1947, Dybas, Mar. 15-25, 1948, Maehler, June and July 1946, Oakley, Mar. 1948, on *Hibiscus tiliaceus,* Maehler; southwest Koror, 25 m., Dec. 1952, Gressitt. NGERKABESANG (Arakabesan): Thirty-five males and 22 females, July 1946, Townes. MALAKAL: One female, Sept. 1952, Krauss. NGARMALK (NW. Auluptagel): Three males and two females, 25 m., Dec. 1952, Gressitt.

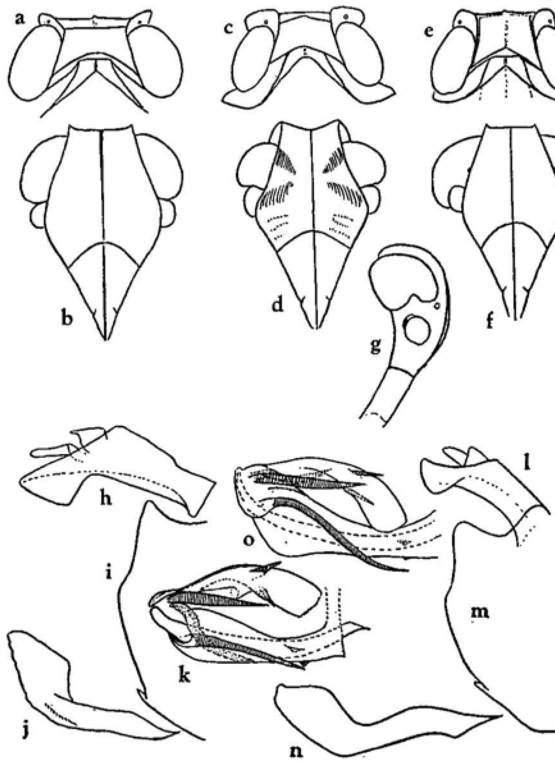


FIGURE 14.—*Dystheatias orpheus:* **a**, vertex; **b**, frons and clypeus (Aurapushekaru); **c**, vertex and pronotum; **d**, frons and clypeus (Babelthuap); **e**, vertex and pronotum; **f**, frons and clypeus; **g**, head in profile (Babelthuap); **h**, anal segment of male (Babelthuap); **i**, posterior margin of pygofer (Babelthuap); **j**, genital style (Babelthuap); **k**, aedeagus (Babelthuap); **l**, anal segment (Aurapushekaru); **m**, pygofer (Aurapushekaru); **n**, genital style (Aurapushekaru); **o**, aedeagus (Aurapushekaru).

Genus **Dystheatias** Kirkaldy

Dystheatias Kirkaldy, 1907, Hawaiian Sugar Planters' Assoc. Exper. Sta., Ent. Bull. **3** (1) : 113 (haplotype: *Dystheatias beecheyi* Kirkaldy, op. cit.).

Dystheatias belongs to a complex of genera, relatively weak on present evidence, which includes *Eucarpia* Walker as its oldest member. The true relationships and synonymy within the complex must await more genitalic studies. On the basis of data so far available, I believe that *Dystheatias* will be retained as a distinct natural unit, though whether as a genus or subgenus remains to be decided. This genus appears to be approaching the Marshall Islands along two routes: from the west through the Palau Islands and Truk and from the south through Fiji and Rotuma.

23. Dystheatias orpheus Fennah, n. sp. (figs. 14, *a-o;* 15; 16, *a-c*).

Width of vertex at apex 1.8 times length in middle line; lateral margins of frons diverging almost straight to below level of antennae, thence incurved.

Male testaceous or pale fuscous, stramineous or testaceous below; vertex, pronotum and mesonotum, except carinae, lightly suffused brown, two circular paler spots in anterior third of mesonotal disc. Tegmina hyaline, suffused yellowish, usually with granules along veins infuscate. Female darker, with membrane heavily suffused fuscous.

Pygofer moderately short, dorsolateral angles shortly subangulately produced, medioventral process triangular. Anal segment relatively short, anal foramen situated distad of middle, distal half of segment deflexed through about 45 degrees, and in profile slightly expanded distally. Aedeagus tubular, a minute lobe ventrally near base, directed lateroventrad, a long sinuate spinose process arising on right at apex, lying along right side, directed cephalad, a stout spine dorsally on right at apex extending cephalad for half length of aedeagus, a sinuate spine at apex on left side, directed ventrocephalad; flagellum with a short slender spine on right side one-third from apex, and a small spine on left ventral margin one-quarter from apex. Genital styles narrow in approximately basal three-fifths, with parallel margins in profile, distally curved upward through 45 degrees and expanded into a trapezoidal lobe.

Male: length 2.8 mm., tegmen 4.2 mm.; *female:* length 2.9 mm., tegmen 4.0 mm.

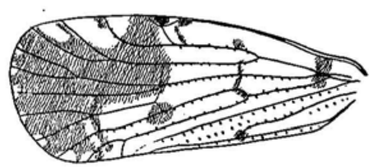


FIGURE 15.—*Dystheatias orpheus,* tegmen from specimen shown in figure 14, *e, f,* and *g*.

Holotype, male (US 62120), Babelthuap, Palau Is., Dec. 20, 1947, Dybas. Babelthuap: Four male and six females, Dec. 20, 1947, Dybas; Ulimang, Dec. 1947, Dybas; east Ngatpang, 65 m., Dec. 1952, Gressitt. Koror: One female, northeast, 40 m., on Limestone Ridge, Dec. 1952, Gressitt. Ulebsehel (Auluptagel): Eight males and six females, Jan. 1948, Dybas, Sept. 1952, Krauss. Ngurukdabel (Urukthapel): One male and one female, 180 m., Ngeremdiu, Dec. 1952, Gressitt.

DISTRIBUTION: Western Caroline Is. (Palau).

The length of two of the aedeagal spines differed slightly in two of the males examined, but it is not possible to assess the significance of this difference without further material. The species is distinguished by the proportions of the head and by the male genitalia.

24. Dystheatias tyndaris Fennah, n. sp. (fig. 16, *h-m*).

Vertex subquadrate, 1.6 times as broad across apex as long in middle line.

Very pale green, powdered with white; antennae and legs pale stramineous. Tegmina hyaline lightly powdered with white wax; a short oblique band across claval suture at middle, an arcuate band from node to distal fifth of clavus, an uneven band from distal end of stigmal cell, across subapical transverse veins to apex of clavus, sordid yellow or pale yellowish brown, veins concolorous. Wings hyaline powdered white, veins greenish brown.

Anal segment of male moderately long and relatively broad, lateral margins in profile concave, apical margin truncate, lateroapical angles narrowly and subacutely produced ventrad. Pygofer with posterior lateral margin broadly convex, medioventral process narrowly triangular. Aedeagus subtubular, a rather long broad parallel-sided spinose process on left at base of flagellum directed cephalad, flagellum with a moderately long broad ensiform spinose process on right, distally weakly decurved, a deeply bifurcate process dorsoapically, with left limb longer than right, directed cephalad. Genital styles evenly curved dorsad distally, ventral margin rounding distally into apical margin, apical angle subacute.

Male: length 2.3 mm., tegmen 3.9 mm.; *female:* length 2.8 mm., tegmen 4.4 mm.

Holotype, male (US 62122), and 10 males and allotype and five females from Truk. Tol I.: Alt. 280 m., Mt. Unibot, Dec. 30, 1952 and Jan. 1, 2, Feb. 4, 1953, Gressitt.

DISTRIBUTION: Caroline Is. (Truk).

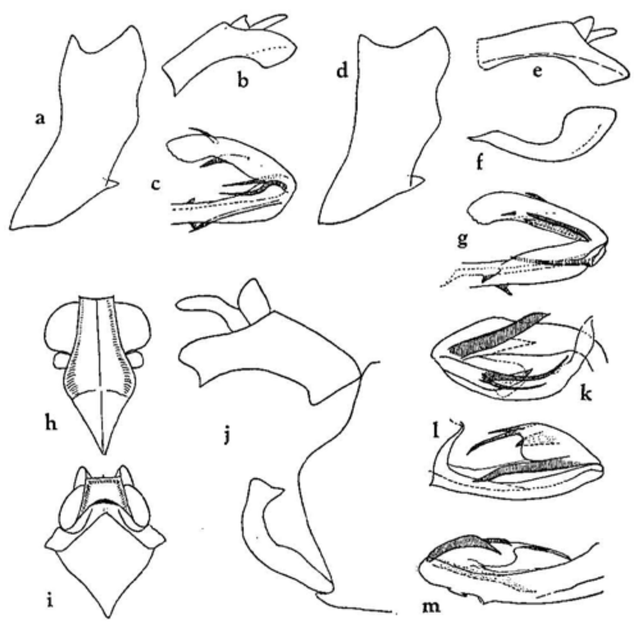


FIGURE 16.—**a-c**, *Dystheatias orpheus: a,* pygofer; *b,* anal segment; *c,* aedeagus, left side. **d-g**, *D. telamon: d,* pygofer; *e,* anal segment; *f,* genital style; *g,* aedeagus, left side. **h-m**, *D. tyndaris: h,* frons and clypeus; *i,* head and thorax, dorsal view; *j,* anal segment, pygofer, and genital style, right side; *k,* aedeagus, dorsal view; *l,* aedeagus, left side; *m,* aedeagus, right side.

This species is easily distinguished by the pale-green coloration and the shape of the male genitalia.

25. Dystheatias telamon Fennah, n. sp. (fig. 16, *d-g*).

Tegmina with membrane mostly fuscous distad of transverse cross veins, veinlets of M and Cu pale testaceous at apex, those of Sc and R piceous at apex. Male genitalia mostly pale stramineous.

Anal segment of male of same shape as in *D. orpheus* but relatively longer. Pygofer with dorsolateral angles produced in a subquadrate lobe, margin strongly sinuate. Aedeagus with two short spinose processes in basal half, one ventral and one on left side, a long spine arising on right at apex, directed cephalad; a pair of equal spines, shorter than the foregoing arising at base of flagellum, directed cephalad, a short spinose process on upper surface of flagellum (in repose), and a similar process on left side of flagellum distad of the dorsal spine. Genital styles narrow and shallowly curved in basal half, smoothly expanding distally, apical margin rounded-truncate.

Male: length 3.2 mm., tegmen 4.8 mm.; *female:* length 3.7 mm., tegmen 5.3 mm.

Holotype (US 62121) and four males, allotype and five females and two mutilated specimens, Ngarmalk (NW. Auluptagel), Palau Is., Sept. 1952, Krauss; 25 m., Dec. 13, 1952, Gressitt. Two females, Ngurukdabel (Urukthapel) I., Ngaremediu, 190 m., Gressitt, are assigned here because of their size and general coloration, as is one female from northeast Koror, 40 m., Limestone Ridge, Dec. 14, 1952, Gressitt.

DISTRIBUTION Western Caroline Is. (Palau).

This species differs from *D. orpheus* in its consistently larger size and less uniform coloration. In specimens with the tegminal membrane deeply infuscate, the corium is, at most, only narrowly marked with fuscous at the forks of Sc+R and Cu_1, whereas in *D. orpheus* the corium of darkly marked specimens is twice banded fuscous piceous. In the male genitalia the relative positions of the basal and distal processes are different from their counterparts in *D. orpheus.* The pair of spines at the base of the flagellum is symmetrical in *D. telamon,* whereas in *D. orpheus* the spine on the left side is strongly sinuate and that on the right is straight. The differences between the three species of the genus discussed here and their counterparts in Fiji are best appreciated when the figures of the male genitalia are compared.

Genus **Oliarus** Stål

Oliarus Stål, 1862, Berliner Ent. Zeitschr. **6**: 306 (logotype: *Cixius walkeri* Stål, 1859, Freg. Eugenies Resa, Zool. **4**: 272).

This genus, as now recognized, includes a miscellany of forms varying considerably in bodily size and proportions, and this diversity is apparent in the western Pacific members of the complex. Kirkaldy erected *Urvillea* for a striking Fijian form which agrees closely in superficial characters with one of the specimens described below. But in *U. melanesica* Kirkaldy, the type species, the medioventral process of the male pygofer, in ventral view, is almost mushroom-shaped, a form to which that of the species below bears no resemblance. I believe that when *Oliarus* is revised the form of the medioventral process will provide a criterion of generic or subgeneric value. Accordingly I prefer to assign the Micronesian species to *Oliarus sensu lato*, then to break down the

compact "genitalic" concept of *Urvillea*. Such nomenclatorial conservatism should not be allowed to minimize the possibility that the following species are not at all remote taxonomically from the Fijian *U. melanesica*.

26. Oliarus carolinensis Metcalf (fig. 17, *a-g*).

Oliarus carolinensis Metcalf, 1954, Elisha Mitchell Sci. Soc., Jour. **70** (1) : 1.

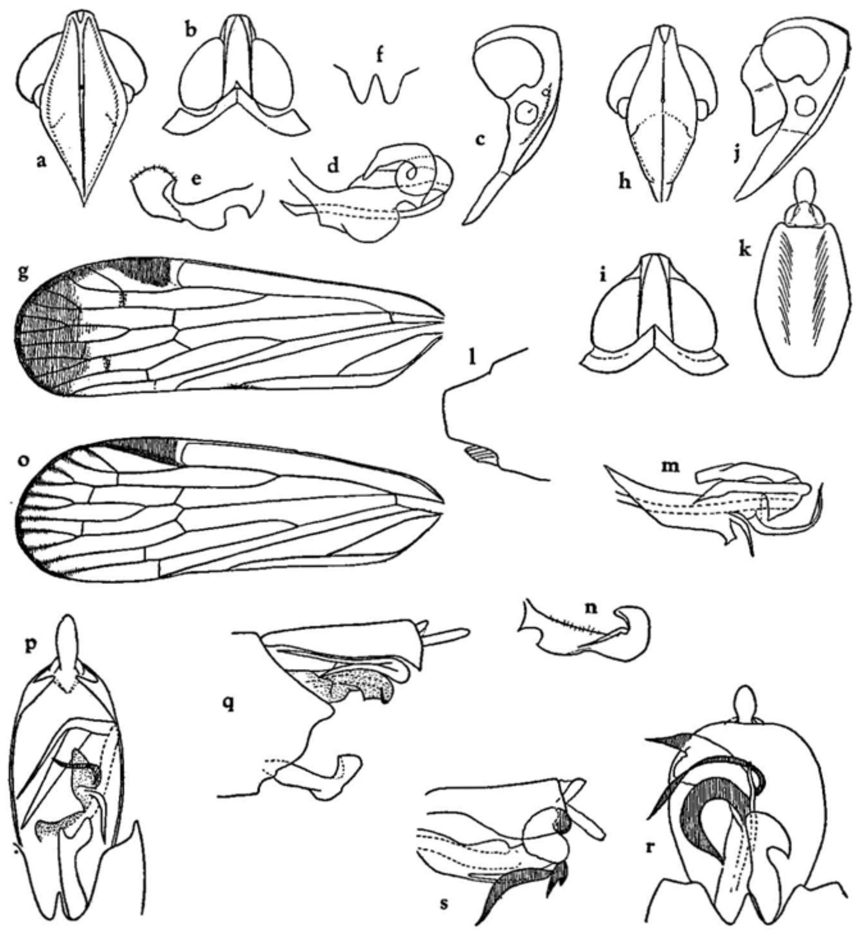


FIGURE 17.—**a-g**, *Oliarus carolinensis: a,* frons and clypeus; *b,* vertex and pronotum; *c,* head in profile; *d,* aedeagus; *e,* genital style; *f,* medioventral process of pygofer; *g,* tegmen. **h-o,** *O. trachas: h,* frons and clypeus; *i,* vertex and pronotum; *j,* head in profile; *k,* anal segment of male, dorsal view; *l,* posterior margin of pygofer; *m,* aedeagus; *n,* genital style; *o,* tegmen. **p, q,** *O. boninensis: p,* male genitalia, ventral view, left genital style omitted; *q,* male genitalia, left side. **r, s,** *O. ogasawarensis: r,* male genitalia, ventral view, left genital style omitted; *s,* male genitalia, left side.

Vertex 2.5 times as long in middle line as wide at base. Frons with median ocellus present, very small; frontoclypeal suture feebly indicated. Post-tibiae apically six-toothed. Basal metatarsal joint seven-toothed, second metatarsal joint five-toothed.

Black; carinae of vertex, lateral carinae of frons broadly and median carina narrowly, sides of head, antennae, rostrum except apical joint, pronotum laterally, tegulae, and legs except tarsi yellowish testaceous. Tegmina hyaline, a linear mark where the united claval veins unite with the hind margin, stigma, subapical cross veins (of which R-M and M-Cu are much basad of those in M), and frequently apical cells of M fuscous, veins concolorous. Wings hyaline, infuscate close to apical margin, veins fuscous.

Pygofer moderately long, lateral margins broadly convex, ventral margin excavate, medioventral process in ventral view elongate triangular, coarsely horizontally striate. Anal segment in dorsal view ovate, distally truncate, medial line broadly raised, anal foramen at apex. Aedeagus broadly tubular, dorsal left margin in profile sinuate, dorsal right margin distinctly higher, straight; flagellum tubular, pigmented and slightly sclerotized, coiled through 540 degrees to point ventrocephalad at apex. Genital styles in profile narrow at base, then abruptly expanded and as abruptly constricted again at middle, then expanded in a broad U-shaped lobe with a thin flange projecting mesad from its basad edge.

Male: length 4.4 mm., tegmen 5.4 mm.

DISTRIBUTION: Eastern Caroline Is.

PONAPE. Two males and five females, Nanpil, Nett District, Mar. 1948, Dybas; Mt. Temwetemwensekir, 180 m., Jan. 1953, Gressitt; Sankakuyama-Colonia, July 1939, Esaki; Nipit-Kapiroi-Reitao, July 1939, Esaki.

The species is distinguished from *O. boninensis* Matsumura and *O. ogasawarensis* Matsumura by the shape of the aedeagus, and from *U. melanesica* by the shorter vertex and the structure of every element of the male genitalia.

27. Oliarus trachas Fennah, n. sp. (fig. 17, *h-o*).

Vertex 2.6 times as long in middle line as wide at base. Frons with median ocellus very small but distinct; frontoclypeal suture feebly indicated. Post-tibiae six-toothed at apex, basal metatarsal joint seven-toothed, and second metatarsal joint five-toothed.

Stramineous, legs pale testaceous. Tegmina hyaline, tinged pale yellow; stigma fuscous, veins on corium pale yellow, distad of nodal line gradually becoming darker, and infuscate at fuscous margin. Coloration of wings and wing veins corresponding to tegmina.

Pygofer long, lateral margins produced in a broad quadrate lobe with its distal margin oblique, ventral margin excavate, medioventral process elongate-triangular, coarsely horizontally striate. Anal segment in dorsal view ovate, distally truncate, anal foramen at apex. Aedeagus tubular, a short spine arising ventrally at apex, directed ventrad, a longer spine arising almost at same point directed caudad then curved to right, flagellum sclerotized, a short stout spine on right at its base, a long, very stout spinose process, a little swollen before its tip, directed anteriorly and loosely overhung by a sheathlike process of equal length. Genital styles of same form as in preceding species but with flange on mesal surface much longer.

Male: length 4.0 mm., tegmen 4.4 mm.

Holotype, male (US 62124), Mt. Pairot, Ponape, Mar. 13, 1948, Dybas. Ponape: Three males and two females, Mt. Pairot summit, about 600 m., Mar. 13, 1948, Dybas; Mt. Temwetemwensekir, 100-180 m., Jan. 1953, Gressitt; One-Nipit, July 1939, Esaki.

DISTRIBUTION: Eastern Caroline Is. (Ponape).

This species differs strikingly from the preceding one in the more elongated

tegminal membrane. The shape of the vertex, the pygofer, anal segment, and genital styles prove that they are congeneric; but they are relatively remote from one another and, indeed, from any other species with which they might be compared.

28. Oliarus ogasawarensis Matsumura (fig. 17, *r, s*).

Oliarus ogasawarensis Matsumura, 1914, Annot. Zool. Japon. **8** (3, 4) : 422.

DISTRIBUTION: Bonin Is., southern Mariana Is.

S. MARIANA IS. SAIPAN: One male and one female. Tapotchau, May 1940, Yasumatsu and Yoshimura; Matansha-Banaderu, July 1939, Esaki.

29. Oliarus boninensis Matsumura (fig. 17, *p, q*).

Oliarus boninensis Matsumura, 1914, Annot. Zool. Japon. **8** (3, 4) : 423.

DISTRIBUTION: Bonin Is.

BONIN IS. CHICHI JIMA: One male and one female, 1931, Motoike and Ise. HAHA JIMA: 1931, Motoike and Ise.

FAMILY DELPHACIDAE LEACH

KEY TO GENERA OF DELPHACIDAE OF AUSTRALASIA AND PACIFIC ISLANDS (ADAPTED FROM MUIR WITH ALOHINI PARTLY AFTER ZIMMERMAN)

1. Post-tibial spur subulate, circular or angulate in cross section, acute at apex, devoid of teeth laterally (Asiracinae) 4
   Post-tibial spur cultrate or laminate, thick, convex on each side or concave on inner surface with teeth on hind margin (Delphacinae) 2

2 (1). Post-tibial spur cultrate, solid 3
   Post-tibial spur laminate or foliaceous, sometimes tectiform, with or without teeth along posterior margin (Delphacini) 34

3 (2). Post-tibial spur with inner and outer surfaces convex, with distinct teeth on posterior margin (Alohini) 13
   Post-tibial spur with inner surface concave; no teeth along posterior margin (Tropidocephalini) 22

4 (1). Anal angle of tegmina subquadrate; frons 1.5 times broader at widest part than at base .... **Ostama** Walker
   Anal angle of macropterous tegmina deeply rounded; frons not as above 5

5 (4). Both segments of antennae cylindrical or nearly so 7
   First segment of antennae cylindrical, shorter than second; second segment elongate-ovate and considerably flattened, at least basally 6

6 (5). Frons with a single median carina only .... **Punana** Muir
   Frons with two longitudinal submedian carinae, no median carina .... **Ugyopana** Fennah

7 (5). Frons with two longitudinal submedian carinae, no median carina 8
   Frons with median carina only, forked or simple 10

8 (7). Second segment of antennae more than three times length of first 9
   Second segment of antennae less than three times length of first .... **Ugyops** Guérin-Méneville

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* Asterisks indicate new genera.

9 (8). Vertex quadrate, relatively short..**Perimececera** Muir
Vertex three times as long as broad..............................**Jugodina** Schumacher

10 (7). First segment of antennae much shorter than second.......................................11
First and second segments of antennae subequal, cylindrical..........................12

11 (10). Frons at most only little longer than broad..**Livatiella***
Frons much longer than broad..**Melanesia** Kirkaldy

12 (10). Median carina of frons simple; mesonotum tricarinate................**Melanugyops***
Median carina of frons forked; if simple, mesonotum five carinate............
....**Ugyops** Guérin-Méneville

13 (3). Antennae with first segment broader than long, second segment short, thick, often subovoid; if not, then frons bicarinate and tegmina impressed along nodal line..14
Antennae with first segment distinctly longer than broad, second segment cylindrical or only slightly enlarged at middle...16

14 (13). Frons with two submedian longitudinal carinae, approximated basally, distally or both, but not united...**Leialoha** Kirkaldy
Frons with a single median carina, simple or at most forked only at extreme base 15

15 (14). Pygofer with an upcurved spine on each lateral margin; both sexes with a short median process overlying anal style at its base...........................
....**Nesodryas** Kirkaldy
Pygofer laterally unarmed; both sexes with anal style simple, devoid of second median process..**Nesothoë** Kirkaldy

16 (13). Head considerably elongated, longer than thorax and abdomen combined
....**Dictyophorodelphax** Swezey
Head not elongate...17

17 (16). Frons with two submedian longitudinal carinae, sometimes very closely apposed 18
Frons with a single median carina, simple or forked.......................................19

18 (17). Tegmina surpassing middle of abdomen...................................**Aloha** Kirkaldy
Tegmina extending just beyond base of abdomen..............**Nesorestias** Kirkaldy

19 (17). Mesonotum with disc rounded and separated from scutellum by a depression 21
Mesonotum with disc flattened, no distinct depression between disc and scutellum 20

20 (19). Tegmina usually surpassing middle of abdomen, veins distinct....................
....**Nesosydne** Kirkaldy
Tegmina not surpassing middle of abdomen; venation obscure and coarse
....**Nothorestias** Kirkaldy

21 (19). Antennae with second segment twice as long as first; vertex with mediolateral carinae uniting at apex of head.......................**Proterosydne** Kirkaldy
Antennae with second segment about 1.6 times length of first; vertex with mediolateral carinae united basad of apex of head......................**Vizcaya** Muir

22 (3). Lateral carinae of vertex and frons foliately raised..23
Lateral carinae of vertex and frons not foliate...24

23 (22). Antennae with first segment flattened, foliaceous, longer than second. (If tropidocephaline, *Holzfussella* Jacobi belongs here, being separated from *Purohita* by the strong median carina on vertex and the first antennal segment being only a little longer than the second.)............**Purohita** Distant
Antennae with first segment not foliaceous, subequal to second..................
....**Lanaphora** Muir

24 (22). Antennae with first segment smoothly cylindrical, if at all flattened then longer than broad with lateral margins subparallel........26
Antennae with first segment only a little longer than wide, broader at apex than at base........25

25 (24). Frons broader at base than at apex........**Belocera** Muir
Frons narrower at base than at apex........**Bambucibatus** Muir

26 (24). Vertex triangular with sides more or less curved, sometimes elongate........27
Vertex quadrate........28

27 (26). Vertex three times as long as pronotum and mesonotum combined, flattened laterally........**Pseudembolophora** Muir
Vertex much shorter, flattened dorsally........**Tropidocephala** Stål

28 (26). Antennae longer than frons, if only slightly, frons with lateral carinae straight, subparallel, clypeus in profile not bent at a right angle to face....30
Antennae not longer than frons........29

29 (28). Lateral carinae of frons arcuate or subparallel; antennae with first segment not two-thirds as long as second; clypeus in profile slightly curved........31
Lateral carinae of frons arcuate; antennae with first joint two-thirds as long as second; clypeus in profile bent at right angle to frons........**Arcofacies** Muir

30 (28). Antennae slightly longer than frons, first segment slightly flattened, about as long as second........**Sogatopsis** Muir
Antennae much longer than frons, first segment distinctly shorter than second........**Malaxa** Melichar

31 (29). Vertex triangular, frons four times as long as broad........**Conocraera** Muir
Vertex not triangular, frons shorter........32

32 (31). Median carina of frons forked at base; tegmina with Sc+R forked basad of nodal line........33
Median carina of frons not forked; tegmina with Sc+R not forked basad of nodal line........**Upachara** Distant

33 (32). Frons less than twice as long as broad, lateral margins arcuate; tegmina with Sc+R fork near level of union of claval veins....**Pundaluoya** Kirkaldy
Frons twice as long as broad, lateral margins straight, diverging distad; tegmina with Sc+R fork distad of union of claval veins........**Zuleika** Distant

34 (2). Mesonotum with five carinae........35
Mesonotum with less than five carinae........36

35 (34). Head in profile semicircular; antennae terete........**Paranda** Melichar
Head in profile not semicircular; antennae with first segment compressed, dilated, obliquely triangular; second segment slightly longer than first........**Eodelphax** Kirkaldy

36 (34). Antennae with one or both segments distinctly flattened........37
Antennae cylindrical or at most only slightly flattened........38

37 (36). Frons with median carina forked near level of lower margin of eyes........**Perkinsiella** Kirkaldy
Frons with median carina forked at extreme base........**Brachycraera** Muir

38 (36). Femora and tibiae of first and second pairs of legs compressed and foliaceous........**Phyllodinus** Van Duzee, **Peliades** Jacobi
Legs not foliaceous........39

39 (38). Carinae of head obscure, vertex little broader than long, second segment of antennae about twice as long as first, first segment of post-tarsus longer than second and third combined........**Anectopia** Kirkaldy
Carinae of head distinct........40

40 (38). Frons with two submedian longitudinal carinae, vertex quadrate, lateral carinae of pronotum not reaching hind margin................**Criomorphus** Curtis
Frons with a single median carina, simple or forked..41

41 (40). Mediolateral carinae of vertex converging apically, continued separately on to frons, where they unite (median carina of frons forked)....................42
Mediolateral carinae of vertex uniting on vertex, union sometimes indistinct, continued on to frons as a single carina..50

42 (41). Basal segment of antennae longer than broad..43
Basal segment of antennae as broad as long..46

43 (42). Vertex longer than broad..44
Vertex as broad as long..**Peregrinus** Kirkaldy

44 (43). Median carina of frons simple..**Megamelus** Fieber
Median carina of frons furcate..45

45 (44). Lateral margins of frons distinctly sinuate, frons appreciably narrower at base than at apex; ventral hind margin of pygofer with processes.......... ....**Tarophagus** Zimmerman
Lateral margins of frons subparallel, frons scarcely narrower at base than at apex; ventral hind margin of pygofer entire, devoid of processes ....**Euidellana** Metcalf

46 (42). Vertex distinctly longer than broad..47
Vertex as broad as long or broader..48

47 (46). Post-tibial spur with 12-15 small teeth..**Stenocranus** Fieber
Post-tibial spur with eight large teeth..**Kelisia** Fieber

48 (46). Frons with median carina simple or forked not more than one-third from base..**Delphacodes** Fieber
Frons with median carina forked more than one-third from base....................49

49 (48). Median carina of frons forked near middle..........................**Dicranotropis** Fieber
Median carina of frons forked near apex..........................**Leimonodite** Kirkaldy

50 (41). Lateral carinae of pronotal disc straight or converging posteriorly, attaining posterior margin or nearly so..51
Lateral carinae of pronotal disc curved, diverging posteriorly, not reaching posterior margin..58

51 (50). Head including eyes distinctly wider than pronotum; posterior edge of eyes reaching nearly to posterior angle of pronotum; vertex only slightly produced before eyes, apically truncate..............**Smicrotatodelphax** Kirkaldy
Head including eyes not wider than pronotum; posterior edge of eyes not reaching near to posterior angle of pronotum..52

52 (51). Antennae with second segment not twice as long as first..................................53
Antennae with second segment more than twice as long as first......................55

53 (52). Lateral carinae of pronotal disc parallel in apical half, angulate at middle and diverging in basal half; lateral carinae of mesonotal disc diverging basally ....**Gelastodelphax** Kirkaldy
Lateral carinae of pronotal disc not parallel in apical half, straight or slightly concave, diverging throughout; lateral carinae of mesonotum parallel or nearly so..54

54 (53). Lateral margins of frons parallel throughout..........................**Megamelus** Fieber
Lateral margins of frons shallowly convex..........................**Coronacella** Metcalf

55 (52). Length from apex of vertex to tip of mesoscutellum at least twice width of head including eyes..**Stenocranus** Fieber
Length from apex of vertex to tip of mesoscutellum about 1.5 times width of head with eyes..56

56 (55). Frons truncate at base, widest at apex, lateral margins straight........ **Sogata** Distant
Frons curved or subconical at base, narrower at apex than at middle, lateral margins slightly arcuate........ 57
57 (56). Apex of head in profile angular........ **Haplodelphax** Kirkaldy
Apex of head in profile rounded, not angular........ **Kelisia** Fieber
58 (50). Mediolateral carinae of vertex meeting before its apex, vertex markedly produced beyond eyes........ **Sardia** Melichar
Mediolateral carinae of vertex meeting at its apex........ 59
59 (58). Vertex distinctly longer than broad, narrower at apex than at base........ **Chloriona** Fieber
Vertex not or only slightly longer than broad........ 60
60 (59). Frons almost as broad as long........ 61
Frons longer than broad........ 62
61 (60). Apex of head in profile angular, median carina of frons and mesonotum distinct........ **Eoeurysa** Muir
Apex of head in profile rounded, median carina of frons and mesonotum feeble or obsolete........ **Eumetopina** Breddin
62 (60). Frons much longer than broad (about 2.5: 1)........ **Nilaparvata** Distant
Frons longer than broad but not greatly so........ **Delphacodes** Fieber

Genus **Ugyops** Guérin-Méneville

Ugyops Guérin-Méneville, 1834, Voy. aux Indes Belanger **1**: 477 (haplotype: *Ugyops percheronii* Guérin-Méneville, op. cit.).

Key to Micronesian Species of Ugyops Stål

1. Frons with median carina single to base, Marshall Is........ **superciliata**
Frons with median carina forked near middle, or with a pair of submedian carinae........ 2
2 (1). Frons with median carina forked........ 3
Frons with a pair of submedian carinae........ 9
3 (2). Second antennal segment of male at least 1.8 times as long as first segment; that of female twice as long, Ponape........ **kinbergi kinbergi**
Second antennal segment relatively shorter in the respective sexes........ 4
4 (3). Frons of male more than 3.2 times as long as broad; vertex 2.51 times longer in middle line than broad........ 5
Frons of male not more than 3.2 times as long as broad, vertex not more than 2.5 times as long in middle line as broad at middle of eyes........ 7
5 (4). Submedian carinae of frons almost parallel, widest apart near middle of frons; genae not inflated below eyes........ **kinbergi civilis**
Submedian carinae of frons not parallel, widest apart near basal fifth of frons, genae inflated below eyes........ 6
6 (5). Dorsal margin of vertex shallowly concave in profile. Female with second antennal segment 1.3 times as long as first........ **kinbergi kusaieana**
Dorsal margin of vertex straight in profile. Female with second antennal segment not as above........ **kinbergi magas**
7 (4). Vertex in middle line, measured to apex of median carinae, not less than twice as long as broad across base just anterior to level of middle of eyes........ 8
Vertex in middle line not more than 1.9 times as long as broad at middle of eyes, Palau Is........ **kinbergi palauana**

8 (7). Submedian carinae of frons converging at base, symmetrically with distal union, widest apart near middle; carinae of pronotal median disc uniting at anterior margin.......... **kinbergi guahoni**
Submedian carinae of frons not converging at base, widest apart at base; carinae of pronotal disc not meeting, but entering transverse anterior margin separately .... **vittatus**

9 (2). Frons twice as long as broad, second antennal segment 1.5 times as long as first, Rota.......... **rotana**
Frons and second antennal segment relatively longer..........10

10 (9). Frons 2.2 times as long as broad..........12
Frons relatively longer or shorter..........11

11 (10). Second antennal segment 2.3 times as long as first, Ponape.......... **apollo**
Second antennal segment less than twice as long as first, Yap.......... **ariadne**

12 (10). Frons 2.3 times as long in middle line as broad; second antennal segment more than 1.6 times as long as first, Anatahan.......... **anatahani**
Frons not quite 2.2 times as long in middle line as broad; second antennal segment slightly less than 1.6 times as long as first, Guam.......... **annulipes**

30. **Ugyops kinbergi kinbergi** Stål (fig. 18, *a-i*).

Ugyops kinbergi Stål, 1859, Freg. Eugenies Resa. Zool. **4**: 274.

Vertex in middle line twice as long as broad, frons longer than broad (3.45 : 1), second antennal segment of male 1.8 times as long as first; of female twice as long as first. Ocelli obsolete or non-functional. Tegmina with Sc distally three-branched.

"Fusco-testacea, genis ante oculos thoraceque parce sordide flavescente-sparsis; tegminibus subvinaceo-hyalinis, obscurius nervosis, maculis duabus parvis commissurae ante medium, vitta apicali maculisque marginis apicalis fuscis, antennis pedibusque testaceo-flavis."

Male: length 7.9 mm., tegmen 8.8 mm.; *female:* length 8.2 mm., tegmen 9.8 mm.

DISTRIBUTION: Eastern Caroline Is.

PONAPE. Fifteen males, seven females, and 18 nymphs: Nanpil, Nett District, Mar. 1948, Dybas; Mt. Kupuriso, Mar. 1948, Dybas; Mt. Temwetemwensekir, July-Sept. 1950, Adams; 180 m., Jan. 1953, Gressitt; Mt. Beirut,

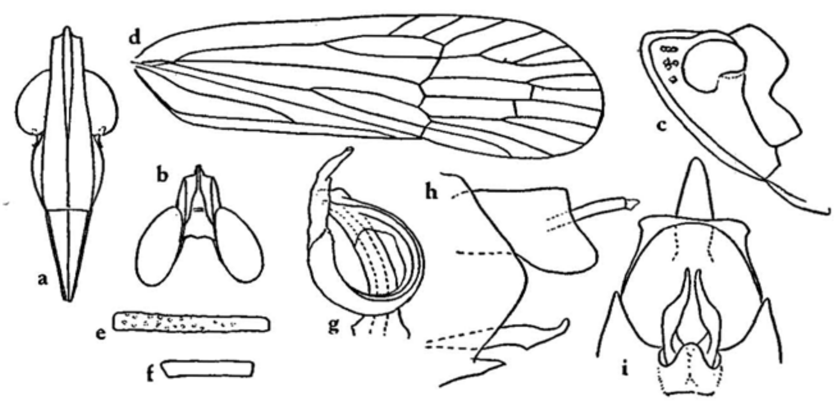


FIGURE 18.—*Ugyops kinbergi kinbergi:* **a**, frons and clypeus; **b**, vertex; **c**, head in profile; **d**, tegmen; **e**, second segment of antenna; **f**, basal segment of antenna; **g**, aedeagus; **h**, anal segment and pygofer, lateral view; **i**, male genitalia, ventral view.

July-Sept. 1950, Adams; Peipalap Peak, July-Sept. 1950, Adams; Mt. Nanalaud, 150-450 m., Mar. 1948, Dybas; Anak, Aug. 1948, Townes; Hydroelectric Station, Colonia, Aug. 1946, Townes; Colonia, Aug. 1946, Oakley; Mt. Dolennankap, 510-600 m., Aug. 1946, Townes; Mt. Tolenkiup, July 1950, Adams, Dec. 1948, Maehler; Nipit, July 1939, Esaki; Sokehs (Jokaj) I., 2 m., Jan. 1953, Gressitt, July 1939, Esaki.

This is one of the largest species in the genus and is characterized by the extreme elongation of the frons and clypeus. It is the only named member of a complex of generally similar forms distributed through Micronesia at a uniform density of one to each island where collections have been made. It is quite possible that each of these forms represents an endemic species, but in the absence of direct evidence of their reproductive isolation only those in which appreciable differences in the male genitalia can be demonstrated are here recognized as new species. The remainder are placed as subspecies within their appropriate specific complex.

31. **Ugyops kinbergi guahoni** Fennah, n. subsp. (fig. 19, *a-f*).

Vertex in middle line 2.1 times as long as broad across base (near level of middle of eyes), frons longer than broad (3.2:1), second antennal segment of male 1.65 times length of first, of female 1.44 times length of first. Ocelli distinct. Tegmina with Sc three-branched at apex.

Markings as in typical subspecies, sometimes more and sometimes less intensely developed, tegminal band occasionally percurrent from base to apex parallel with commissural margin.

Male: length 6.0 mm., tegmen 7.4 mm.; *female:* length 6.9 mm., tegmen 7.8 mm.

Holotype, male (US 62134), Mt. Santa Rosa, Guam, south Mariana Is., June 3, 1954, G. Bohart and Gressitt. Saipan: One male, two females, and one nymph, Tapotchau, May 1940, Yasumatsu and Yoshimura; Papago area, Jan., Apr. 1945, Dybas. Agiguan: One male, June 1952, Kondo. Rota: One male and one female, native forest near Sabana, 360 m., June 1946, Townes. Guam: Six males, nine females, and 10 nymphs; Pati Pt., June 1945, Dybas; Yigo, Aug. 1952, Krauss; 1 mile east of Yigo, May 1945, Dybas; Mt. Santa Rosa, June 3, 1945, Bohart and Gressitt; Pt. Ritidian, June 1945, Bohart and Gressitt, June and Dec., 1945, Gressitt; Mt. Alutom, June 1946, Townes; Harmon Field, on *Cestrum,* Jan. 1949, Maehler; Mt. Lamlam, Oct. 1952, Krauss; Haputo Pt., Mar. 1948, Maehler; Pt. Oca, July 1945, Bohart and Gressitt; Pilgo River, May 1945, Bohart and Gressitt; Talofofo, Aug. 1952, Krauss; Mt. Balanos, Aug. 1952, Krauss; Sinajana, Aug. 1945, Wallace.

DISTRIBUTION: Southern Mariana Is.

This subspecies is distinguished by the proportions of the vertex and frons and the relative length of the antennal segments and by the presence of distinct ocelli. In the male genitalia the margin of the medioventral process is subquadrate, not convex as in the typical subspecies. One female from Anatahan (Aug. 26, 1951, R. Bohart) is provisionally placed here. The vertex is 2.12 times as

long as broad, the frons 3.18 times, whereas the second antennal segment is 1.6 times the length of the first; ocelli are present.

32. **Ugyops kinbergi palauana** Fennah, n. subsp. (figs. 19, *g-k;* 20, *p*).

Vertex in middle line 1.9 times as long as broad across base, frons longer than broad (3.17 : 1), second antennal segment of male 1.6 times length of first, that of female 1.65 times length of first. Ocelli present. Tegmina with Sc three-branched at apex. Markings and general coloration as in typical subspecies.

Male: length 6.0 mm., tegmen 6.9 mm.; *female:* length 6.8 mm., tegmen 8.7 mm.

Holotype, male (US 63140), Angaur, Palau Is., Feb. 1948, Dybas. Babelthuap: Nine males, six females, and 11 nymphs, Ulimang, Dec. 1947 and wooded peak southwest Ulimang, Dec. 1947, Dybas; Emertao, Feb. 1938, Esaki; Ngiwal, July 1946, Townes; Ngeremeskang, 30 m., Dec. 1952, Ngat-

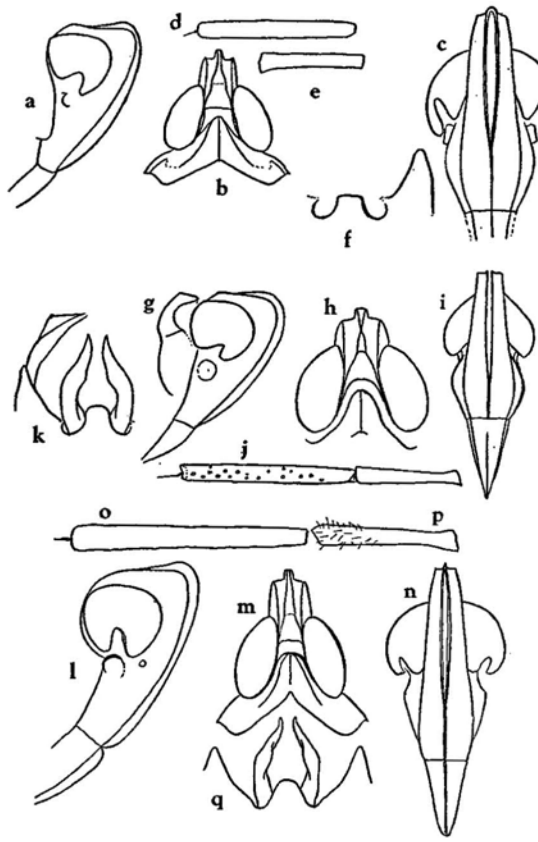


FIGURE 19.—**a-f,** *Ugyops kinbergi guahoni: a,* head in profile; *b,* vertex and pronotum; *c,* frons; *d,* second segment of antenna; *e,* first segment of antenna; *f,* medioventral process of pygofer. **g-k,** *U. kinbergi palauana: g,* head in profile; *h,* vertex; *i,* frons and clypeus; *j,* antenna; *k,* genital styles and left half of pygofer and anal segment. **l-q,** *U. k. civilis: l,* head in profile; *m,* vertex and pronotum; *n,* frons and clypeus; *o,* second segment of antenna; *p,* basal segment of antenna; *q,* genital styles and medioventral process of pygofer.

pang, 65 m., Dec. 1952, Gressitt. Koror: Two males, one female, one mutilated specimen, and one nymph, Nov. 1947, Dybas; Sept. 1952, Beardsley, 12 m., northeast Limestone Ridge, Nov. 1947, Dybas; Dec. 1952, Gressitt. Ngarmalk (NW. Auluptagel): One female and two nymphs, Sept. 1951, Gressitt; Sept. 1952, Krauss. Ngaiangl (Kayangel): One male, three females, and one nymph, Ngariungs, Dec. 1952 and Ngajangel, Gressitt. Ngergoi (Garakayo): One female, Aug. 1945, Dybas. Peleliu: Six males, two females, one mutilated specimen, and four nymphs, northeast coast, Jan. 1948 and east coast, Jan. 1948, Dybas; Akarokuru, Aug. 1939, Esaki. Angaur: Four males, six females, and four nymphs, Feb. 1948, Dybas.

DISTRIBUTION: Western Caroline Is. (Palau).

Four females from Pulo Anna (Sept. 1952, Krauss), are tentatively ascribed to this subspecies because of their general resemblance and the smallness of the available sample.

This subspecies is distinguished by the proportions of the vertex and frons, and by the relative length of the antennal segments. As in the typical subspecies there is a moderate range of variation in the degree to which the fuscous markings are developed.

33. **Ugyops kinbergi civilis** Fennah, n. subsp. (fig. 19, *l-q*).

Vertex in middle line 2.28 times as long as broad across base, frons longer than broad (3.3: 1), second antennal segment of male 1.65 times length of first, of female 1.75 times length of first. Ocelli obsolescent or absent; if apparently present, non-functional. Tegmina with Sc three-branched at apex. Markings and coloration as in typical subspecies.

Male: length 5.1 mm., tegmen 6.8 mm.; *female:* length 5.7 mm., tegmen 7.5 mm.

Holotype, male (US 62203), Truk, Wena (Moen), Mt. Teroken, north slope, Mar. 19, 1949, Potts.

YAP. YAP: Five males, six females, and three nymphs, Yaptown, July 1946, Townes; Mt. Matade, 95 m., Dec. 1952, Gressitt; Mt. Gillifitz, 150 m., Nov. 1952, 50 m., hill behind Yaptown, Dec. 1952, Gressitt; Yap I., Sept., Oct. 1952, Krauss. MAP: Oct. 1952, Krauss.

CAROLINE ATOLLS. ULITHI: One female and six nymphs, Potangeras I., Nov. 1947, Dybas; Fassarai, Oct. 1952, Krauss; Mogmog, Oct. 1952, Krauss. FAIS: One male, Oct. 1952, Krauss. SOROL: Three females and two nymphs, Oct. 1952, Krauss. WOLEAI: Twenty-five males, 12 females, and 28 nymphs, Falulap, Jan. 1938, Esaki; Utegal, July 1946, Townes, Feb. 1953, Beardsley; Falalis, Sept., Oct. 1952, Krauss; Woleai I., Sept. 1952, Krauss. FARAULEP: Two males, eight females, and nine nymphs, Faraulep I., Sept. 1952, Krauss, Feb. 1953, Beardsley; Pigue, Sept. 1952, Krauss. IFALUK: Seven males, nine females, and two nymphs, Ifaluk I., Sept. 1952, Krauss, Feb. 1953, Beardsley; north end of Falarik, Aug., Sept. 1953, Bates. ELATO: One male, Elato I., Sept. 1952, Krauss. SATAWAL: One male and one female, Sept. 1952, Krauss. NOMWIN: Four males and three females, Nomwin I., May

1946, Oakley, Feb. 1954, Beardsley; Fananu, Feb. 1954, Beardsley. NAMA: Three males and one female, Dec. 1950, Langford, Oct. 1952, Beardsley. LOSAP: One male, Pis, Oct. 1952, Beardsley. ETAL: One male, Etal I., Nov. 1952, Beardsley. SATAWAN: One male and three females, More I., Nov. 1952, Beardsley.

TRUK. Twenty-four males, 26 females, one mutilated specimen, and three nymphs. WENA (Moen): Mt. Teroken, Dec. 1952, Feb. 1953, Gressitt, Jan. 1949, Maehler; lower north slope, Mt. Teroken, Mar., Apr. 1949, Potts; Epinup, Mar. 1949, Potts; southern valley, Mt. Tonaachau, Apr. 1949, Potts. TON (Tol): Mt. Unibot, 360 m., Apr. 1949, Potts, May 1946, Townes and Dec. 1952, Jan. 1953, in native forest, Gressitt; Pata, Sabote-Epin, Apr. 1940, Yasumatsu and Yoshimura. TONOAS (Dublon): May 1946, 300-360 m., Townes; Udot I., May 1946, Townes. FEFAN: Mt. Iron, Jan. 1953, Gressitt, May 1946, Townes.

DISTRIBUTION: Caroline Is. (Yap, Caroline atolls, Truk).

As small population samples from several islands in the western Carolines resemble *U. kinbergi civilis* rather more than any other subspecies, they are here tentatively referred to it. As with the Marshall Island material discussed below, it is the taxonomic difficulty of estimating the range of intrapopulation variation which prompts this conservative approach. It is to be surmised that a critical comparison of adequate population samples, when this is possible, will show more exuberant subspeciation of *U. kinbergi* than is recognized here.

This subspecies is close to the typical subspecies, but is distinguished by the proportions of the vertex and frons and by the relative length of the antennal segments.

34. Ugyops kinbergi magas Fennah, n. subsp. (fig. 20, *e, f*).

Vertex in profile level, not concave. Second antennal segment 1.3 times as long as first.

Holotype, male (US 63141), Airek I., Ailinglapalap Atoll, Marshall Is., Aug. 1946, Townes. Nine males, six females, and four nymphs, Airek, Aug. 1946, Townes; Bigatyelang, Aug. 1946, Oakley; Jaluit, five males and two females, Medyado I., Aug. 1946, Townes; Imrodj I., five males and one female, Aug. 1946, Oakley.

DISTRIBUTION: Marshall Is.

This subspecies is distinguished from *U. kinbergi kusaieana*, its nearest neighbor, by the level vertex when viewed in profile, by the antennal proportions, by the greater degree of infuscation on the anal area of the tegminal membrane, and in the female, by a dark suffusion on subapical cell M_3+_4.

The following population samples resemble the material from Ailinglapalap and are referred to *U. k. magas* for the purposes of this report: Arno Atoll, Elizabeth I., Sept. 1953, three males and five females, Beardsley; Ine I., June 1950, La Rivers; Ebon Atoll, Ebon I., two males and one female, Feb. 1945,

Wallace, Sept. 1953, Beardsley; Namorik Atoll, Namorik I., two males, Sept. 1953, Beardsley.

35. Ugyops kinbergi kusaieana Fennah, n. subsp. (fig. 20, *a-d*).

Vertex in profile very shallowly concave, genae relatively tumid below antennae. Antennae with second segment 1.6 times as long as first. Color as in typical subspecies, though pattern of markings not developed to exactly the same extent; a rufous oblique vitta before antennae.

Holotype, male of subspecies (US 62126), Lele I., Kusaie, Aug. 1946, Oakley. Kusaie: Fifty-five males, 45 females, and 16 nymphs. Lele I., Aug. 19, 1946, Oakley and 100 m., Mar. 1953, Clarke; Mt. Tafeayat, 150-240 m., Aug.

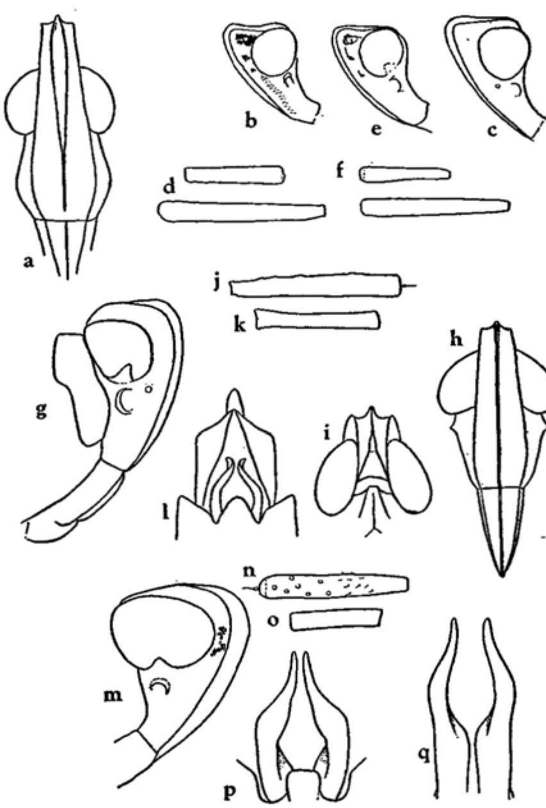


FIGURE 20.—**a-d,** *Ugyops kinbergi kusaieana: a,* frons; *b,* head in profile (male); *c,* head in profile (female); *d,* first and second antennal segments. **e, f,** *U. k. magas: e,* head in profile (male); *f,* first and second antennal segments. **g-l,** *U. superciliata: g,* head in profile; *h,* frons and clypeus; *i,* vertex; *j,* second segment of antenna; *k,* first segment of antenna; *l,* male genitalia, ventral view. **m-o,** *U. ariadne: m,* head in profile; *n,* second segment of antenna; *o,* first segment of antenna. **p,** *U. kinbergi palauana:* genital styles, ventral view. **q,** *U. vittatus:* genital styles, ventral view.

1946, Townes; Mt. Buache, 450-600 m., Aug. 1946, Townes, Dec. 1937, Esaki; Matanluk (Yepan), 22 m., Jan. 1953, Clarke; Mt. Matante, 580 m., Feb. 1953, Clarke; "Hill 1010," 300 m., Apr. 1953, Clarke; "Hill 541," 165 m., Jan., Mar. 1953, Clarke.

DISTRIBUTION: Eastern Caroline Is. (Kusaie).

This subspecies differs from the typical subspecies in the greater degree of inflation of the genae below the eyes and in the relative length of the antennal segments. In the male it differs in the deeper and subvertical apical margin of the anal segment and, in the female, in the relatively broader frons.

36. **Ugyops kinbergi** subspp.

DISTRIBUTION: Caroline Is.

CAROLINE ATOLLS. SONSOROL: One male, three females, and three nymphs, Sept. 13, 1952, Krauss. NUKUORO: Nukuoro I., three males, seven females, and two nymphs, Aug. 1946, Oakley.

Each of these populations is likely to prove subspecifically distinct when adequate material for study is available.

37. **Ugyops superciliata** Fennah, n. sp. (fig. 20, *g-l*).

Vertex in middle line 1.5 times as long as broad across base, of subequal width throughout, base at level of middle of eyes, mediolateral carinae converging distally to meet slightly distad of level of anterior margin of eyes, apical margin biconcavely transverse, interrupted by median carina, frons longer than broad (2.95 : 1), median carina simple throughout, slightly broadened basally, clypeus with median carina slender, genae only slightly tumid, ocelli present and apparently functional, antennae with second segment 1.37 times as long as first. Thorax and legs generally as in *U. kinbergi*. Tegmina macropterous, Sc+R fork level with union of claval veins, Cu_{1a} fork slightly distad.

Testaceous to stramineous; carinae, an intercarinal stripe on each side of middle of frons; an arcuate band on sides of head before eyes, prothorax and mesothorax behind eyes, pro- and mesotibiae and tarsi and abdomen dorsolaterally and ventrolaterally fuscous.

Tegmina hyaline with grayish-yellow tinge: in male veins almost concolorous, infuscate obliquely from junction of claval veins to Sc near middle of costal margin, apical cells of R to Cu distally infuscate except for a triangular hyaline area centered on cell M_2: in female veins castaneous and infuscation, in same areas, darker and more extensive.

Pygofer moderately short dorsally and laterally, much longer ventrally, medioventral process almost equilaterally triangular, distally rounded. Anal segment of moderate length, bilaterally symmetrical, steeply tectiform, anal foramen near apex, apical margin narrow, and in ventral view subrectangulate in middle. Genital styles rounded, of subequal width for most of length, incurved in distal third with apices apposed, upcurved, and bluntly rounded.

Male: length 5.8 mm., tegmen 5.9 mm.; *female:* length 6.0 mm., tegmen 7.0 mm.

Holotype, male (US 62131), Arno Atoll, Marshall Is., June 17, 1950, Usinger. Marshall Is., 17 males, 26 females, and five nymphs, Ine I. on *Wedelia* and *Polypodium,* June 1950, Usinger and June, Aug. 1950, La Rivers; Kwajalein, three males, Aug. 1944, Bryan; Jaluit, two males and one female, Sydney Pier, Aug. 1946, Townes; Majuro, 15 males, 17 females, and one nymph, Majuro Village, Aug. 1946, Townes, Oakley (one specimen taken on taro), Apr. 1949, on *Hibiscus tiliaceus,* Owen.

CAROLINE ATOLLS. MOKIL: Two males and one female, Jan. 1953, Gressitt, June 1948, Owen. PINGELAP: One male and three females, Jan. 1953, Gressitt.

PONAPE. Three males (two brachypterous) and one female, Colonia, Ponape, Nov. 1952, Uchiyama; Colonia, Jan. 1949, Owen; Mt. Tolenkiup, July 1950, Adams.

KUSAIE. Eight males and nine females, Mt. Tafeayat, 150-240 m., Aug. 1946, Townes and 90 m., Feb. 1953, Clarke.

DISTRIBUTION: Marshall Is., eastern Caroline Is.

This species differs from *U. kinbergi* in the carination of the frons; in the proportions of the frons, vertex, and antennal segments; in the shape of the

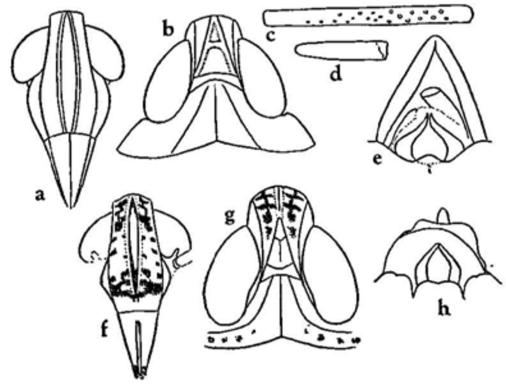


FIGURE 21.—**a-e,** *Ugyops apollo: a,* frons and clypeus; *b,* vertex and pronotum; *c,* second segment of antenna; *d,* basal segment of antenna; *e,* male genitalia, ventral view. **f-h,** *U. ariadne: f,* frons and clypeus; *g,* vertex and pronotum; *h,* male genitalia, ventral view.

male genitalia; and in the color pattern. In view of the relative uniformity of the *U. kinbergi Rassenkreis* (if that is what it is) over the widely scattered Mariana and Caroline Islands, the appearance of so distinct a species to the east of all these is of considerable interest. The collections from the Marshall Islands show that *U. kinbergi* occurs there as well as *U. superciliata.* Collections of *Ugyops* from the Gilbert Islands might throw light on the question of the origin of *U. superciliata.* The view is taken here that, in the area under study, this species is endemic in the eastern Carolines and the Marshall Islands.

38. **Ugyops vittatus** (Matsumura). (Figure 20, *q.*)

Bidis vittatus Matsumura, 1906, Sapporo Nat. Hist. Soc., Trans. **1**: 31, pl. 1, fig. 5.

Vertex along middle line 2.1 tines as broad as base just anterior to middle of eyes, base slightly narrower than apex, frons longer than broad (3.0-3.1 : 1), submedian carinae widest apart at base, second antennal segment 1.7 times as long as basal, antennae as long as frons and clypeus, genae not tumid, ocelli obsolete. Tegmina not long, but exceeding abdomen, Sc+R fork, Cu_1 fork, and union of claval veins at same level.

No specimens of this species occur in the present collections; but as a male topotype from Okinawa in the collection of the California Academy of Sciences is at hand, opportunity is here taken to compare it with the preceding species.

This species is superficially closest to *U. kinbergi guahoni,* but it is separated by numerous details of bodily proportion, of which those given in the synopsis are the most obvious. The carinae of the vertex in *U. kinbergi guahoni* converge sinuately and strongly distad and, at the apex, form a fine knife-edged median ridge. In *U. vittatus* they converge strongly in the basal third only and weakly in the distal two-thirds, together forming a very broad ridge at the apex.

DISTRIBUTION: Okinawa, Bonin Is.

39. Ugyops annulipes annulipes (Stål). (Figure 22, *a-f*.)

Delphax annulipes Stål, 1854, Öfv. K. Vet.-Akad., Förh. **11**: 245.

Antennae with second segment 1.57 times as long as first.

"Dilute griseo-flavescens; fronte carinis fusco-maculatis, basi apiceque inter carinas nigro-fusca; ibique maculis nonnullis flavis ornata; tegminibus subsordide vitreis, fusco-striolatis; annulis tibiarum fuscis. ♂ long. 5, lat. 2½ millim . . . Patria: Insula Guam vel Guahon."

DISTRIBUTION: Southern Mariana Is.

S. MARIANA IS. SAIPAN: One male, Mt. Tagpochau, 375 m., Feb. 1945, Dybas. TINIAN: Two females, Hagoya, June 1946, Townes; Mt. Lasso, northwest slope, Apr. 1945, Dybas. GUAM: Thirteen males, 13 females, and one nymph, Mt. Santa Rosa, May, June 1945, Bohart and Gressitt; Pt. Manell,

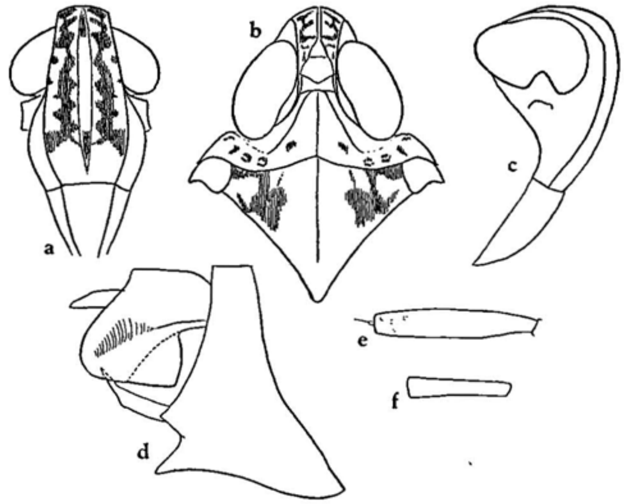


FIGURE 22.—*Ugyops annulipes annulipes:* **a**, frons and clypeus; **b**, head and thorax; **c**, head in profile; **d**, male genitalia, lateral view (left margin of anal segment in broken line); **e**, second segment of antenna; **f**, first segment of antenna.

May 1945, Bohart and Gressitt; Agana, May 1948, Maehler; Asan, Dec. 1945, Gressitt; Pago, May 1945, Gressitt; Pago Bay, June 1945, Dybas; Pt. Oca, NAMRU-2, June 1945, Bohart and Gressitt.

The material agrees with Stål's description and figure and with my notes made from the holotype in the Naturhistoriska Riksmuseet, Stockholm. It is apparently this species which Metcalf has figured (1946, B. P. Bishop Mus., Bull. **189**: 109) and referred to *U. samoaensis* Muir. *Ugyops samoaensis* differs from the above species in the proportions of the vertex, frons, and antennae and in the shape of the pygofer. This, in ventral view, is not longer than broad in *U. annulipes,* whereas in *U. samoaensis* the length exceeds the width by about one-third.

I have considered the evidence in favor of the occurrence of a polytypic species with its members scattered sublinearly from Micronesia to Australia. The obvious points of agreement between *U. annulipes* Stål, *U. samoaensis* Muir, and *U. sulcata* Muir comprise (1) a vertex which is longer than broad and narrower between the eyes than at the apex, (2) a frons with paired submedian carinae united at base and apex, (3) transverse or potentially transverse fuscous marks on the frons, (4) tegmina which are short or only slightly exceed the apex of the abdomen, and (5) a pygofer with the medioventral process shallowly excavate. This combination must distinguish this polytypic specific concept from all other *Ugyops,* and the definition embraces, among others, the species *U. demeter* Fennah, *U. zimmermani* Fennah, *U. laui* Fennah, *U. bianor* Fennah, *U. samoaensis* Muir, *U. sulcata* Muir, and *U. annulipes* Stål. *U. musgravei* Muir (from Lord Howe I.) is a marginal form. If it is excluded, it becomes necessary, for the rigorous definition of the remaining bloc of species, to segregate them by proportions of vertex and the occurrence of a simple excavation of the hind margin of the medioventral process of the pygofer, which is shallowly biconcave in *U. musgravei.* But the proportions of the vertex, and of other parts of the body, are appreciably different in the species listed above. In fact, those of *U. bianor* are little different from those of *U. musgravei.* Moreover, the shape of the medioventral process of the pygofer is accurately matched by that of *U. necopinus* Fennah, which on other characters is excluded from the group under consideration.

If, on the other hand, *U. musgravei* is included in the concept, the definition must be relaxed in respect to proportions of vertex and shape of genitalia. This means that the external differences between members of the putative polytypic species are substantially greater than between this and other species which are not included, whereas the number of marginal forms increases. In short, the evidence so far brought forward that *U. annulipes, U. samoaensis,* and *U. sulcata* are members of a single species is not convincing.

The above comment is pertinent to a wider issue: is *Livatis* Stål, currently suppressed as a synonym of *Ugyops,* retainable as the name of a subgeneric

concept embracing the annulipes-like forms? Stål, with a characteristic specimen of *Ugyops* before him (*U. kinbergi* from Ponape) erected *Livatis* to receive *annulipes,* in the belief that the latter represented an intermediate generic step between *Ugyops* and *Delphax auctt.* The characters which suggest themselves for such a subgeneric concept are (1) a frons not more than 2.5 times as long as broad, (2) submedian carinae not united in a stalk, often obsolete distally, and (3) a vertex not more than twice as long in middle line (to base of occiput) as broad at apex. Such a definition, however, immediately raises the question of the subgeneric position of *U. astrolabei* Fennah, which is marginal. Moreover, only frontal proportions separate the gross form of *U. astrolabei* from *U. longiceps* Muir, which in turn is distinguished from strict *Ugyops* by the distal separation of the frontal carinae. *U. robusta* (Distant) from the Seychelles is equally difficult to place. As it appears now, *Ugyops* comprises a series of forms in which almost every character can be recognized as part of a confluent series, not necessarily occurring in correlation, though showing a tendency to do so. It happens that two of the most contrasted forms occur side by side in Micronesia. Accordingly, I cannot now see any taxonomic justification for restoring the name *Livatis,* even in a subgeneric sense.

40. **Ugyops annulipes pisana** Fennah, n. subsp. (fig. 23, *a-c*).

Vertex in middle line 1.9 times width at base. Frons longer than broad (2.1 : 1). Second antennal segment longer than first (1.9 : 1).

Holotype, male (US 62128), Truk, Pis I., June 3, 1946, Townes. Truk: One male and one female, Pis I., June 1946, Townes. Nama: One male, Oct. 1952, Beardsley.

DISTRIBUTION: Eastern Caroline Is. (Nama, Truk).

This subspecies differs from the typical subspecies and from *U. apollo* in the shape of the frons. It resembles *annulipes* in the shape of the vertex but differs in the proportions of the antennal segments, and, compared with *annulipes,* has a more widely flaring male anal segment.

41. **Ugyops ariadne** Fennah, n. sp. (figs. 20, *m-o;* 21, *f-h*).

Closely similar in form to *U. annulipes* Stål. Vertex in middle line 1.5 times longer than wide at apex, apex wider than base; frons 2.25 times longer than broad, submedian carinae united at base and shortly before apex; genae, in anterior view, distinctly angulately bent below level of antennae. Ocelli obsolete. Second antennal segment 1.88 times as long as first. Tegmina with Sc+R forked at basal third, Cu_1 fork not quite level with middle of common claval vein.

Apex of vertex and base of frons transversely barred with black or piceous, four spots on each lateral margin of frons and corresponding spots adjoining submedian carinae, red or black, a transverse band about one-quarter from apex piceous, apex pallid; clypeus pallid at base, otherwise yellowish or testaceous with a brown spot laterally, sometimes with a pink suffusion; distal part of clypeus darker laterally. Body and tegmina as in *U. annulipes.*

Anal segment of male moderately short, bilaterally asymmetrical, on left side shortly

produced in a broad convex lobe directed lateroventrad, on right in a much larger subrectangulate lobe directed ventrad; apical margin shallowly excavate with a distinct medial notch. Pygofer short, especially dorsally and at sides, lateroventral angles shortly produced, in ventral view sinuately convex with a short peglike process at inner angle: medioventral process broader than long, scooplike, with posterior margin shallowly angulately excavate. Aedeagus tubular, porrect caudad in basal half, with flagellum U-shaped, overlying basal portion, expanded in a subtriangular lobe at apex with a long slit at its apical margin. Genital styles sinuate, diverging basally, converging to apposed apices, tapering throughout.

Male: length 4.5 mm., tegmen 3.8 mm.; *female:* length 4.8 mm., tegmen 4.1 mm.

Holotype, male (US 62133), southern Rumung, Yap, July-Aug. 1950, Goss. Yap: Nine males, one female and one nymph, Ruul District, Colonia, Aug. 1950, Goss, May 1949, on *Wedelia biflora,* Maehler, Oct. 1952, Krauss;

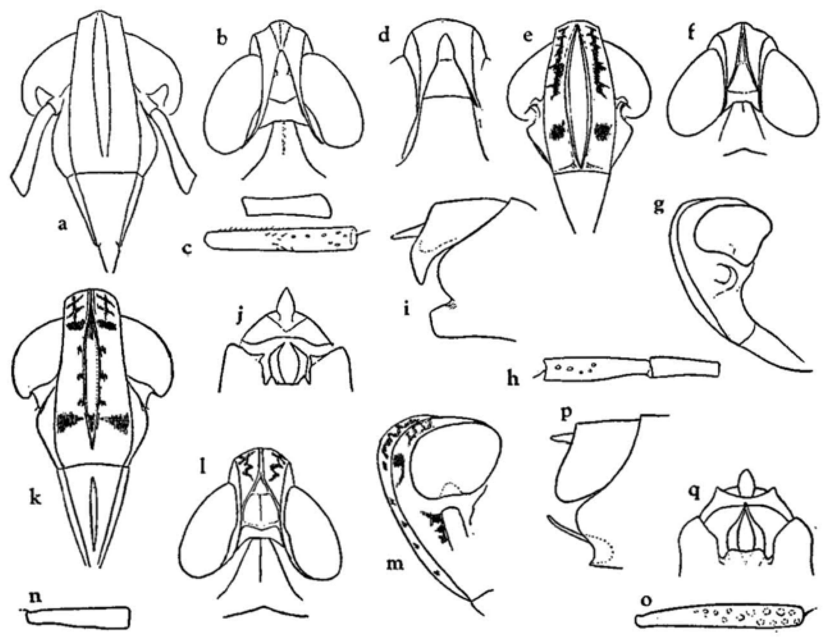


FIGURE 23.—**a-c,** *Ugyops annulipes pisana: a,* frons and clypeus; *b,* vertex; *c,* first (upper) and second (lower) antennal segments. **d,** *U. apollo,* vertex. **e-j,** *U. rotana: e,* frons and clypeus; *f,* vertex; *g,* head in profile; *h,* antenna; *i,* anal segment and posterior margin of pygofer; *j,* male genitalia, ventral view. **k-q,** *U. anatahani: k,* frons and clypeus; *l,* vertex; *m,* head in profile; *n,* basal segment of antenna; *o,* second segment of antenna; *p,* anal segment and posterior margin of pygofer; *q,* male genitalia, ventral view.

hill behind Yaptown, 50 m., Dec. 1952, Gressitt; south Map I., and south Rumung, July-Aug. 1950, Goss.

The following samples have the general appearance of *U. ariadne,* but the specimens are too few to permit any worthwhile decision to be reached con-

cerning the closeness of the relationship. LAMOTREK: One female, Lamotrek I., Feb. 1953, Beardsley. ULITHI: One male and two females, Fassarai I., July 1946, Townes. WOLEAI: One male and one female, Saliap I., Sept. 1952, Krauss; Utagel I., July 1946, Townes. IFALUK: Four males and three females, Sept. 1953, Bates.

DISTRIBUTION: Western Caroline Is.

This species is distinguished from *U. annulipes* Stål by the proportions of the antennal segments, by the distinctly more angulate profile (see figures), and by the more angulate genae. In the genitalia it differs profoundly in the shape of the anal segment and the pygofer and distinctly in that of the medioventral process. The genital styles are more evenly tapering and not at all angulate on their outer margins as seen in ventral view. In coloration this species is distinguished by the marking of the clypeus, which is plain yellow or pale testaceous in *U. annulipes*.

42. Ugyops apollo Fennah, n. sp. (figs. 21, *a-e*; 23, *d*).

Vertex in middle line 1.5 times as long as wide at apex, middle very little narrower than apex, lateral margins slightly concave, anterior margin convex, not appreciably interrupted by median carina; mediolateral carinae converging distad and apposed at apex, united just distad of middle by a transverse carina; frons 2.18 times as long as broad, submedian carinae distinct throughout, united at frontoclypeal suture; clypeus with median carina distinct; genae slightly angulate below antennae in anterior view; ocelli obsolete; antennae with second segment 2.32 times as long as first. Tegmina (brachypterous) with Sc+R fork at basal quarter, Cu_{1a} fork level with junction of common claval vein and sutural margin. Hind tibiae, including spur, as long as brachypterous tegmina.

Pygofer short dorsally, and longer than broad ventrally, lateral margins oblique, straight or very shallowly convex, lateroventral angles weakly produced in a convex lobe, medioventral process rather small, triangular. Anal segment moderately short, bilaterally symmetrical, rather steeply tectiform, lateral ventral margins convex, apex in profile and in ventral view acute. Genital styles broad at base, abruptly narrowed and bent mesad through 90 degrees, thence sinuately tapering to apposed apices, which appear almost acuminate in ventral view and spatulate in profile.

Testaceous, sometimes with greenish suffusion; three bands on second antennal segment, three bands on tibiae and one on basal metatarsal segment, pro- and mesotarsi fuscous. Tegmina translucent, suffused testaceous except for an oblique band near middle and another just distad of nodal line, which are hyaline; veins mostly narrowly fuscous; head and thorax sometimes with red speckling or suffusion.

Male: length 6.0 mm., tegmen 5.0 mm.; *female:* length 7.0 mm., tegmen 4.9 mm.

Holotype, male (US 62132), Mt. Kupuriso, Ponape, Mar. 10, 1948, Dybas. Ponape: Three males, four females, and two nymphs, Mt. Beirut, July-Sept. 1950, Adams; Mt. Temwetemwensekir, 150-300 m., Feb. 1948, Dybas; Mt. Kupuriso, 600 m., Mar. 10, 1948, Dybas; Mt. Nanalaud, 150-600 m., Mar. 1948, Dybas.

DISTRIBUTION: Eastern Caroline Is. (Ponape).

This species is distinguished by the proportions of the vertex, frons, and antennae.

43. Ugyops anatahani Fennah, n. sp. (fig. 23, *k-q*).

Vertex in middle line 1.45 times as long as wide at apex, lateral margins straight, converging basad, base narrower than apex and situated anterior to middle of eyes, anterior margin evenly shallowly convex, not interrupted medially; mediolateral carinae converging distally to meet at level of anterior margin of eyes, thence continued side by side to apex of vertex, a short transverse carina a little before their point of contact; frons in middle line 2.2 times as long as broad, submedian carinae distinct except near frontoclypeal suture; clypeus with median carina distinct, moderately broad; genae rather tumid before antennae as well as below them; antennae with second segment 1.63 times as long as first, second subequal in width to first at its apex, sides almost straight, length seven times greatest width; first and second segments together as long as frons and clypeus. Tegmina (brachypterous) with Sc+R fork at basal third of tegmen, Cu_{1a} fork slightly distad of middle of tegmen, almost level with middle of common claval vein. Hind tibiae, including spur, not as long as tegmina.

Pygofer short dorsally, moderately long slightly below middle and ventrally; lateral margin concave in dorsal half, sinuate-convex in ventral half where lateroventral angles are broadly produced, medioventral process in ventral view short and broad, shallowly excavate on posterior margin. Anal segment short, bilaterally symmetrical, lateroventral margins in side view shallowly convex, apical margin transverse or very shallowly and broadly excavate, anal foramen situated near apex. Genital styles in ventral view convex laterad and of equal width on basal two-thirds, then bent mesad and rather abruptly tapering in distal third.

Grayish stramineous; fuscous markings on body in same position as in *U. annulipes*, though in general not so intensely developed.

Male: length 4.3 mm., tegmen (brachypterous) 4.0 mm.

Holotype, male (US 62130), Anatahan, northern Mariana Is., Aug. 26, 1951, R. Bohart. Anatahan: Two males, Aug. 26, 1951, Bohart. Saipan: One male and one female, southern part, Apr. 1945 and Papago area, Jan. 1945, both by Dybas.

DISTRIBUTION: Mariana Is. (Anatahan, Saipan).

This species most nearly resembles *U. annulipes*. It differs in its distinctly smaller body size, in the proportions of the frons, in the shape of the genae, and slightly in the degree of declivity of the frons as seen in profile. It also differs in the relative lengths of the antennal segments and the distinctly longer and more slender second segment, in the shape of the anal segment and of the lateral margins of the pygofer, and in the relative length of the pygofer. In the tegmina the relative positions of Sc+R fork, Cu_1 fork, and the union of the claval veins are similar in both species. In *U. annulipes,* Sc distally recedes a little from the costal margin and gives off three branches to the margin, in *U. anatahani,* Sc gradually and evenly approaches the costal margin throughout its length and is two-branched distally. Moreover, in *U. annulipes* the tegmina are widest at the level of the claval apex, whereas in *U. anatahani* they are widest at the level of Sc+R fork. In coloration and pattern the two species are similar, but the infuscate markings are usually less prominent in *U. anatahani.*

44. Ugyops rotana Fennah, n. sp. (fig. 23, *e-j*).

Vertex in middle line 1.44 times as long as wide at apex, lateral margins straight, converging basad, base narrower than apex and situated anterior to middle of eyes, anterior margin shallowly convex with entire middle half shallowly projecting; mediolateral

carinae evenly converging distad and apposed at apex, linked together by a short transverse carina slightly before level of anterior margin of eyes; frons 2.0 times as long as broad, submedian carinae distinct throughout, united at frontoclypeal suture; clypeus with median carina broadly raised; genae rather abruptly tumid below antennae; antennae with second segment 1.5 times as long as first, both combined not exceeding length of frons and clypeus. Tegmina (brachypterous) with Sc+R fork very slightly distad of fork of Cu_{1a}, latter slightly distad of union of claval veins. Hind tibiae, with spur, not as long as tegmina.

Pygofer short dorsally, relatively long laterally and moderately so ventrally, lateral margins broadly convex, lateroventral angles not evident as such in profile but visible in posterior view, medioventral process in ventral view broad, very short, shallowly subangulately excavate on posterior margin: in posterior view U-shaped. Anal segment rather short, bilaterally symmetrical, subtectiform, ventral lateral margins in profile straight or very shallowly concave, apical margin simple, transverse, lateroapical angles bluntly rounded, that on left slightly more prominent; anal foramen and anal style situated in apical third. Genital styles in ventral view with outer margins straight in basal two-thirds, then subangulately bent mesad, inner margins apposed in basal quarter and at apex, evenly concave elsewhere; styles tapering distad, acuminate at apex.

Grayish stramineous; anterolateral areas of vertex and frons laterad of submedian carinae in basal third infuscate with the fuscous area invaded on each side by a close row of pallid round spots, a darker fuscous suffusion on each side of median area at apical quarter, disc of clypeus testaceous, antennae lightly suffused fuscous. Tegmina hyaline with grayish stramineous tinge, veins concolorous.

Male: length 3.9 mm., tegmen 3.0 mm.

Holotype, male (US 62129), Rota, southern Mariana Is., June 18, 1951, and another male, June 18, 1951, R. M. Bohart. Saipan: Six males and six females, Tuturam, Lamlam Bay, Jan. 1945, Dybas.

DISTRIBUTION: Southern Mariana Is. (Rota, Saipan).

This species differs from *U. annulipes,* to which it is closely allied, in the relatively broader frons, the more widely separated submedian frontal carinae, the proportions and shape of the vertex, the more declivous frons and clypeus, the shorter antennae and relatively shorter second antennal segment, the differently proportioned anal segment, the generally paler coloration, and the size.

45. **Ugyops eos** Fennah, n. sp. (fig. 24, *a-e*).

Vertex longer than broad (1.8:1), apex as wide as base, measured near middle of eyes, sublateral carinae meeting shortly before apex, distad of anterior margin of eyes, transverse carina at middle feebly present; frons longer than broad (2.7:1), submedian carinae united at base and before apex, obsolete distad of apical junction, genae slightly tumid; antennae cylindrical with second segment 1.75 times length of first. Anal segment bilaterally symmetrical, ventrolateral margins shallowly convex throughout, sides strongly declivous, very feebly longitudinally sulcate, apical margin rectangulately notched at middle. Pygofer with lateral margins evenly convex, medioventral process small with its apical margin strongly convex. Genital styles subterete, sinuately curved, meeting apically in middle line.

Stramineous, frons with about ten small spots adjoining outer side of each submedian carina, and eight or nine similar spots at each lateral margin, clypeus with two spots near base, two near middle and one at apex, two spots on side of head above eyes, a mark on each side of pronotum behind eyes, mesonotum laterally, a few marks on thoracic pleurites, a band across femora at apex and three more or less distinct bands on each pro- and mesotibia fuscous; sometimes a rosy suffusion on genae before antennae. Tegmina hyaline, faintly tinged stramineous, veins pallid, alternated with brown.

Male: length 6.1 mm., tegmen 6.0 mm.; *female:* length 7.0 mm., tegmen 7.0 mm.

Holotype, male (US 62127) Ueru I., Kapingamarangi Atoll, Aug. 4, 1946, Oakley, and five males, two females, and five nymphs, Machiro I., Aug. 1946, Townes; Hare I., Aug. 1946, Townes; Ueru I., Aug. 4, 1946, Oakley.

DISTRIBUTION: Eastern Caroline Is. (Kapingamarangi).

This species is distinguished by the proportions of the vertex and frons and the relative length of the antennal segments.

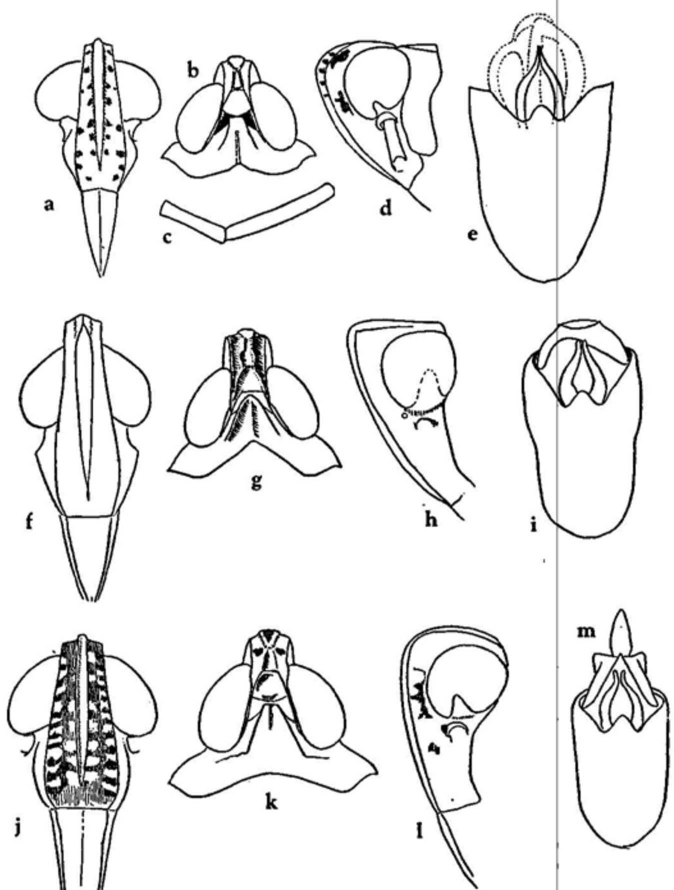


FIGURE 24.—**a-e,** *Ugyops eos: a,* frons and clypeus; *b,* vertex and pronotum; *c,* antenna; *d,* head and pronotum, side view; *e,* pygofer and genital styles, ventral view (position of aedeagus shown in broken line). **f-i,** *Ugyops impictus: f,* frons and base of clypeus; *g,* vertex and pronotum; *h,* head in profile; *i,* male genitalia, ventral view. (Material from Philippines figured here for comparison.) **j-m,** *U. pictifrons: j,* frons and base of clypeus; *k,* vertex and pronotum; *l,* head in profile; *m,* male genitalia, ventral view. (Material from Philippines figured here for comparison.)

Genus **Melanesia** Kirkaldy

Melanesia Kirkaldy, 1907, Hawaiian Sugar Planters' Assoc. Exper. Sta., Ent. Bull. 3(1): 128 (haplotype: *Melanesia pacifica* Kirkaldy, op. cit.)

46. **Melanesia similior** Fennah, n. sp. (fig. 25, *a-f*).

Antennae with second segment about 1.9 times length of first. Median area of frons broadly and shallowly raised throughout, the carinae only feebly defined.

Pale reddish brown; clypeus at extreme base and metapleurites ochraceous, intercarinal areas of frons castaneous piceous, median carina of frons, vertex and carinae of pronotum and mesonotum, and posterior margin of abdominal segments castaneous. Tegmina (brachypterous) translucent, reddish brown; an oblique band from costa near base to middle of commissural margin, a lenticular area on costal margin distally, and veins at apical margin stramineous or pale testaceous.

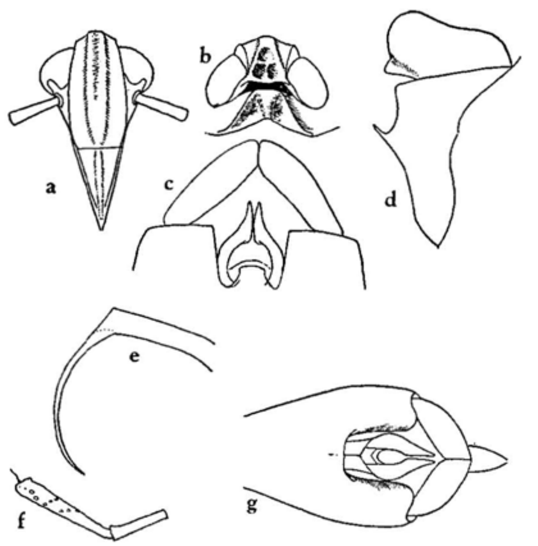


FIGURE 25.—**a-f**, *Melanesia similior: a,* frons and clypeus; *b,* head and pronotal disc; *c,* male genitalia, posteroventral view, aedeagus omitted; *d,* anal segment and pygofer, right side; *e,* aedeagus, ventral view; *f,* antenna. **g**, *M. brevipennis:* male genitalia, ventral view (drawn from specimen marked "type" in U. S. Nat. Mus.).

Anal segment large, hoodlike, apical margin angularly excavate. Pygofer with laterodorsal angles subrectangulate, medioventral process trapezoidal, diaphragm with dorsal margin convex. Aedeagus stout, whiplike, with flagellar portion evenly curved to left and cephalad. Genital styles rather short, stout, curved mesad and apposed in their distal three-sevenths.

Male (brachypterous): length 4.3 mm.

Holotype, male (US 62138), Mt. Nanalaud, 150-450 m., Ponape, Mar. 19, 1948, Dybas.

This species is similar to *M. brevipennis* Muir but differs in the proportions and carination of the vertex, in the shape of the margin of the pygofer and geni-

tal styles, and in the presence of a medioventral process on the pygofer. A figure of the genitalia of *M. brevipennis* is given for comparison (fig. 25, *g*).

DISTRIBUTION: Eastern Caroline Is. (Ponape).

Genus **Livatiella** Fennah, new genus

Vertex broader than long with sublateral carinae meeting in middle at anterior margin, the triangular area which they enclose divided, sometimes feebly, into three compartments, vertex rounding into frons, carinae feeble or obsolete at this point. Frons broad, as long as broad or only slightly longer (1.2:1), with a single median carina, lateral margins distinctly convex; a slight but distinct constriction at frontoclypeal suture; clypeus about as long as frons or slightly longer, medially and laterally carinate. Rostrum reaching to post trochanters, ocelli present; eyes relatively large, kidney-shaped. Antennae rather short, not reaching to level of apex of clypeus, cylindrical, basal segment slightly more than half length of second. Mesonotum with disc broad, its anterior margin transverse, and its posterior margin very weakly concave, lateral discal carinae curving parallel with hind margin of eyes, not attaining posterior margin. Mesonotum with five carinae. Post-tibiae laterally trispinose, apically five-spined with middle spine minute, basal metatarsal segment five-spined with middle spine displaced basad, second metatarsal segment three-spined. Tegmina not much surpassing abdomen, Sc+R fork about level with union of claval veins, Cu_1 fork more distad, nodal line distinctly sinuate; about 11 apical cells; veins more or less immersed in corium, strongly granulate, each granule bearing a seta.

Type: *Livatiella constellaris,* new species.

This genus is closest to *Melanesia* but differs entirely in the form of the head and the relative length of the tegmina and antennae.

47. **Livatiella constellaris** Fennah, n. sp. (fig. 26, *a-c*).

Frons slightly longer than broad (1.1:1), disc polished, piceous except for a transverse subapical band and 12 to 16 round spots near lateral margins and median carina, which are pallid, genae correspondingly marked with frons; disc of vertex, pronotum, and mesonotum, except on posterior margin in each case, brown or testaceous fuscous; posterior margins of preceding, lateral fields of pronotum, antennae, pleura, postfemora except apically, post-tibiae and tarsi, and abdominal ventrites, at least laterally, yellow to stramineous; procoxae, fore and middle legs, abdomen dorsally and sometimes in middle ventrally, pygofer (except at lateroapical angles) and anal segment of male (except along distal margin) fuscous; laterodorsal angles of pygofer pallid stramineous; posterior margin of male anal segment fuscous piceous.

Tegmina with claval veins uniting nearly one-third from apex, corium subtranslucent, mostly fuscous marbled slightly stramineous, and with a distinct circular stramineous spot at base of each seta, membrane sordid stramineous, a spot at each end of nodal line, a spot at fork of M_{1+2}, and apical margin fuscous. Wings slightly infumed.

Anal segment of male short, broad, deflexed and striate distally, apical margin subacutely concave at middle. Pygofer with laterodorsal angles produced in a short fingerlike lobe, ventral posterior margin subrectangulately excavated at middle with lateral angles of emargination produced in a short point. Genital styles diverging from base, then parallel, then angulately bent dorsocaudad and mesad, almost meeting at apex, posterodistal surface flattened.

Male: length 3.9 mm., tegmen 4.0 mm.; *female:* length 3.0 mm., tegmen 3.8 mm.

Holotype, male (US 62136), Mt. Pairot, Ponape, Mar. 13, 1948, Dybas. Truk: One female, Tol I., Mt. Unibot, in native forest, Jan. 1953, Gressitt. Ponape: Twenty-five males and 35 females, Mt. Kupuriso, north slope, 300-

450 m., Mar. 1948, Dybas; Nanpil, Nett District, Feb. 1948, Dybas; Mt. Nanalaud, 150–450 m., May 1948, Dybas; Mt. Tolenkiup and Mt. Tolotom, 640 m., June-Sept. 1950, Adams; Mt. Dolennankap, 510-600 m., Aug. 1946, Townes; Mt. Temwetemwensekir, north slope, Jan. 1953, Clarke; Nampir-Sankakuyama, Jan. 1938, Esaki; Kapiroi-Reitao, June 1939, Esaki; One-Nipit, July 1939, Esaki.

DISTRIBUTION: Eastern Caroline Is. (Ponape, Truk).

The single female from Mt. Tolenkiup has the infuscate areas of a much darker hue than those from Mt. Kupuriso, whereas the single male from Tolotom has only a few small scattered fuscous marks on the corium, which accordingly appears yellowish translucent.

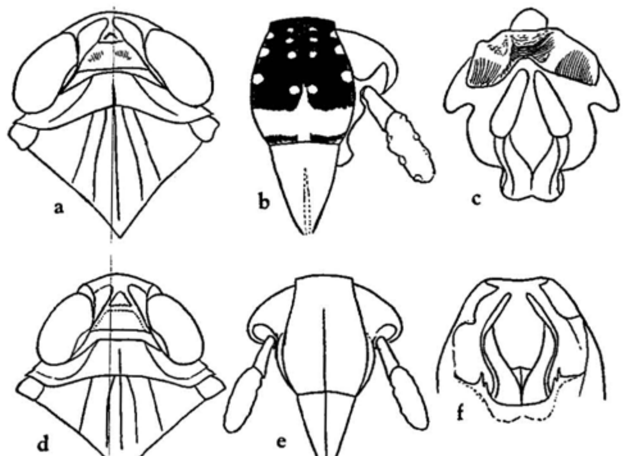


FIGURE 26.—**a-c**, *Livatiella constellaris: a,* head and thorax; *b,* frons and clypeus; *c,* genital styles, anal segment, and posterior margin of pygofer. **d-f**, *L. chrysops: d,* head and thorax; *e,* frons and clypeus; *f,* male genitalia, ventral view.

This species is distinguished by coloration and by the shape of the male genitalia.

48. Livatiella chrysops Fennah, n. sp. (fig. 26, *d-f*).

Frons longer than broad (1.3:1).

Testaceous-stramineous; frons and genae below level of eyes, pronotum, a band between outer pair of carinae on each side of mesonotum, and mesoscutellum pale yellow tinged with green; vertex testaceous, mesonotum otherwise pale brown. Tegmina sordid stramineous, translucent; a faint stripe-like cloud, convex distad, from middle of costal cell across to sutural margin near union of claval veins, a faint line, only developed on veins, parallel to and just basad of nodal line, a small suffusion in membrane at fork of M_{1+2} and a distinct vitta, of uneven intensity and convex basad from margin at R to margin at Cu_1, fuscous. Wings only faintly tinged with brown, veins brown. In male all fuscous markings may be absent except a spot at apex of Cu_1.

Anal segment of male with lateroapical margin narrowly but strongly deflexed and incurved, an almost semicircular excavation at middle of apical margin. Pygofer with laterodorsal angles strongly produced in a spinose process, ventral posterior margin broadly and shallowly excavated at middle, lateral angles of this emargination rather acutely produced with a rather longer spinose process just laterad of each. Genital styles evenly convex laterad, diverging from base and converging and slightly tapering distally, in side view shallowly and smoothly curved upward distally, not angulate.

Male: length 3.2 mm., tegmen 3.5 mm.; *female:* length 3.4 mm., tegmen 4.0 mm.

Holotype, male (US 62137), Mt. Pairot, Ponape, Mar. 13, 1948, Dybas. Ponape: Twenty males, 31 females, and one mutilated specimen, Mt. Kupuriso, 600 m., Mar. 1948, Dybas; Mt. Pairot, 600 m., Mar. 13, 1948, Dybas; Mt. Nanalaud, 600 m., Mar. 1948, Dybas, June-Sept. 1950, Adams; Mt. Dolennankap, 900 m., Aug. 1948, Townes; Nipit-Ninoani, Jan. 1938, Esaki.

DISTRIBUTION: Eastern Caroline Is. (Ponape).

This species is distinguished by coloration and by the shape of the male genitalia.

Genus **Melanugyops** Fennah, new genus

Vertex quadrate, little longer than broad, slightly narrower at apex than at base, a pair of oblique carinae arising at basal angles, and united medially distally, apical margin of vertex transverse, strongly interrupted by projecting median carina, basal margin transverse, near or before level of middle of eyes. Frons longer than broad (about 2.5 : 1) with lateral margins shallowly convex, median carina and lateral margins subfoliate, the latter projecting laterad. Frons and clypeus in profile forming a smooth shallow curve. Eyes only slightly excavate below. Ocelli absent. Antennae cylindrical, not much shorter than frons and clypeus combined, second segment about 1.5 times as long as first. Rostrum with apex of subapical joint attaining post-trochanters. Legs not at all foliate or compressed. Post-tibiae laterally three-spined, apically four-spined, spur long, subulate, terminating in a spine. Pronotum tricarinate, depressed between carinae, two-thirds as long as an eye behind eyes, lateral margins obsoletely bicarinate; mesonotum tricarinate. Tegmina (brachypterous) scarcely reaching to apex of abdomen, Sc+R forked near node, M simple, Cu_1 forked near level of union of claval veins, no claval suture developed but vein Cu_2 distinct to apex; claval area long, with claval veins united slightly basad of its middle; a few submarginal cross veins weakly present, but not forming a definite nodal line; veins not granulate or setose, but intervenal areas distinctly so in distal half. Wings, in brachypterous form, absent. Male genitalia as in *Ugyops*.

Type: *Melanugyops erebea*, new species.

Of the genera currently recognized as belonging to the same subfamily, only *Eucanyra* Crawford agrees with *Melanugyops* in antennal proportions and a single median frontal carina, but *Eucanyra* is separated by having five mesonotal carinae. The general facies of *Melanugyops* recalls *Ugyops;* but the two differ in carination, in length of pronotum, and (in nuances of detail) in almost every external feature. Even in brachypterous *Ugyops* the venation is different and wings, though reduced, are present. In *Ugyops* the two curved intermediate mesonotal carinae, even if weak, are quite evident. In *Melanugyops* not only is there no trace of such structures, but a minute punctiform impression may be developed at a similar distance from the median carina. In

Ugyops the median carina of the mesonotum terminates abruptly at the base of the mesoscutellum; in *Melanugyops* it forms a ridge to the apex of the mesoscutellum.

There are grounds for suspecting that some tropidocephaline genera are more closely allied to Asiracinae than their present location would suggest; but even if the condition of the spur is ignored, *Melanugyops* differs abundantly from any genus of this tribe known to me. It is separated from *Malaxa* by the relatively longer first antennal joint and relatively shorter frons and by the entire facies of the male genitalia, whereas it differs from *Lanaphora* in the carination of the vertex, the proportions of the frons and antennae, the shape of the pronotal carinae, and the number of post-tibial spines.

49. Melanugyops erebea Fennah, n. sp. (fig. *27, a-c*).

Vertex slightly longer than broad (1.17:1), mediolateral carinae meeting at apex, transverse carina absent or obsolete; basal margin anterior to level of middle of eyes, anterior margin transverse or weakly biconcave, interrupted strongly at middle by projecting united carinae. Frons longer than broad (2.4:1), lateral margins and median carina subfoliate acute. Antennae cylindrical with second segment longer than first (1.4:1). Post-tibiae laterally three-spined, apically four-spined.

Castaneous piceous; antennae, clypeus, rostrum, lower side of thorax and legs more or less uniformly testaceous fuscous. Tegmina castaneous; costal margin testaceous;

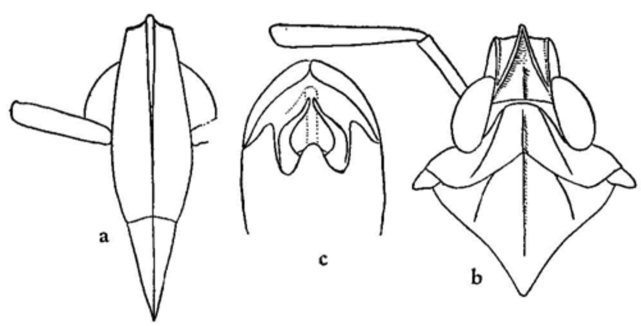


FIGURE 27.—*Melanugyops erebea:* **a**, frons and clypeus; **b**, head, left antenna and thorax; **c**, male genitalia, posteroventral view.

V-shaped fascia from costa at basal third to humeral angle of hind margin, cross vein between R and M, and vein Cu_2 at apex testaceous; setae golden brown. Whole tegmen, with exception of apex of Cu_1, sometimes castaneous piceous.

Anal segment of male moderately large, with sides distad of anal foramen deep and evenly curved, apical margin very shallowly angulately excavate, a very slender groove from midpoint of apical margin to hind margin of anal foramen. Pygofer moderately long, laterodorsal angles moderately produced in a rounded lobe, medioventral process large, subtriangular, distally rounded. Genital styles strongly curved outward in basal half, convergent, tapering and slightly sinuate distally, enclosing an obcordate space.

Male: length 4.5 mm., tegmen (brachypterous) 3.3 mm.; *female:* length 5.1 mm., tegmen (brachypterous) 3.8 mm.

Holotype, male (US 62135), Mt. Tolenkiup, Ponape, June-Sept. 1950, Adams. Ponape: Three males and two females, Mt. Tolenkiup and 510 m.,

Tolotom, both June-Sept. 1950, Adams; Mt. Nanalaud, 150-450 m., Mar. 1948, Dybas.

One male and one female of the series are brachypterous.

DISTRIBUTION: Eastern Caroline Is. (Ponape).

Genus **Perkinsiella** Kirkaldy

Perkinsiella Kirkaldy, 1903, Entomologist **36**: 179 (orthotype: *Perkinsiella saccharicida* Kirkaldy, op. cit.).

50. Perkinsiella bakeri Muir.

Perkinsiella bakeri Muir, 1916, Philippine Jour. Sci. 11: 379.

Post-tibiae laterally bispinose, apically five-spined; calcar with 30-34 small regular teeth.

DISTRIBUTION: Philippines, western Caroline Is.

PALAU. BABELTHUAP: Three males and two females, Ulimang, Dec. 1947, Dybas. KOROR: Five males and four females, Sept. 1952, Krauss; Aug., Sept. 1952, Apr. 1953, Beardsley.

To this species is tentatively assigned a female from Yap (Kolonia, July-Aug. 1950, Goss).

51. Perkinsiella thompsoni Muir.

Perkinsiella thompsoni Muir, 1913, Hawaiian Ent. Soc., Proc. **2** (5): 240.

DISTRIBUTION: Java, western Micronesia.

S. MARIANA IS. SAIPAN: Three males and six females, Garapan, Feb. 1936, Esaki; As Mahetog area, Nov. 1944, Apr. and May 1945, Dybas; Mt. Tagpochau, 375 m., Feb. 1945, Dybas. GUAM: One male, Dededo, on sugar cane, Aug. 1936, Swezey.

PALAU. KOROR: Four males and two females, Sept., Dec. 1952, Mar., Apr. 1953, Beardsley.

YAP. YAP: One male and four females, Sept. 1952, Krauss; hill behind Yaptown, 50 m., Dec. 1952, Gressitt.

TRUK. WENA: Three males and one female, Moen, Civil Administration area, Feb. 1949, Potts.

Genus **Peregrinus** Kirkaldy

Peregrinus Kirkaldy, 1904, Entomologist **37**: 175 (orthotype: *Delphax maidis* Ashmead, 1890, Psyche **5**: 323).

52. Peregrinus maidis (Ashmead).

Delphax maidis Ashmead, 1890, Psyche **5**: 323.

DISTRIBUTION: Tropicopolitan.

BONIN IS. CHICHI JIMA: One female, Miyanohama, Aug. 1934, M. Okabe and H. Ikeda.

S. MARIANA IS. SAIPAN: Fourteen males and 18 females, 2 km. east of Tanapag, July 1945, Dybas; Garapan, July 1939, Esaki; As Mahetog area, Apr., May 1945, Dybas. TINIAN: One male, Sonson, Nov. 1937, Esaki. ROTA: Two males and five females, June 1946, Townes; June 1952, Kondo. GUAM: Fifty-six males, 124 females, and one mutilated specimen, Pt. Oca, May 1945, Dybas and May, June, July 1945, Bohart and Gressitt; Ordot, on corn, May 1945, Bohart and Gressitt; Talofofo Bay, Dec. 1947, Maehler, Aug. 1952, Krauss, and Jan.-Apr. 1945, Baker.

PALAU. KOROR: Five males and 11 females, Mar. 1948, on *Coix lacrima-jobi;* 25 m., southwest, Dec. 1952, Gressitt; Sept. 1952, Krauss; Oct. 1924, Uchiyama; Sept. 1952, Jan., Apr., June 1953, Beardsley. NGARMALK (NW. Auluptagel): One male and five females, 25 m., Dec. 1952, Gressitt. PELELIU: Two males, Akarokuru-Garudoroko, Aug. 1939, Esaki. ANGAUR: One male and two females, Feb. 1948, Dybas; southern part, Feb. 1938, Esaki.

YAP. YAP: One (brachypterous) male and four females, July 1946, Oakley; Kolonia, Mar. 1949, Maehler; hill behind Yaptown, 50 m., Dec. 1952, Gressitt, Oct. 1952, Krauss; Ruul-Ngoi-Nif, Sept. 1939, Esaki.

Genus **Tarophagus** Zimmerman

Tarophagus Zimmerman, 1948, Insects of Hawaii **4**: 245.

53. Tarophagus proserpina (Kirkaldy).

Megamelus proserpina Kirkaldy, 1907, Hawaiian Sugar Planters' Assoc. Exper. Sta., Ent. Bull. **3** (1): 147.

DISTRIBUTION: Indonesia, Pacific islands.

S. MARIANA IS. AGIGUAN: One male, May 1952, Owen.

PALAU. BABELTHUAP: A long series of males and females, July 1946, Oakley; Ngiwal-Kaishar, Aug. 1939, Esaki. KOROR: Two males, and one female, on taro, Aug., Dec. 1952, Beardsley. PELELIU: One female, Akarokuru-Garudoroko, Aug. 1939, Esaki. ANGAUR: Three males, five females, and one nymph, Dec. 1949, Owen and Jan. 1953, Beardsley.

YAP. YAP: One male and one female, July-Aug. 1950, Goss; Gatzapar, Sept. 1939, Esaki.

CAROLINE ATOLLS. SATAWAN: Two males, Nov. 1952, Beardsley. NUKUORO: A series from Nukuoro I., Aug. 1946, Townes.

TRUK. WENA: Three males and five females, Moen, Civil Administration area, Feb. 1949, on *Alocasia,* Potts; Oct. 1952, Beardsley. TONOAS: Jan. 1938, Esaki.

PONAPE. A series, Hydroelectric Plant, Colonia, Aug. 1946, Oakley and Nov. 1953, Beardsley; Colonia, Aug. 1939, Uchiyama; Matalanim-Nipit, Jan. 1938, Esaki.

KUSAIE. A series, Lele I., Aug. 1946, Oakley; Dec. 1937, Esaki.

MARSHALL IS. Majuro: A long series, Majuro I., on taro, Aug. 1946, Oakley. Namorik: One male and one female, Namorik I., Sept. 1953, Beardsley. Kili: Two males, Oct. 1953, Beardsley.

Genus **Dicranotropis** Fieber

Dicranotropis Fieber, 1866, Zool.-bot. Ges. Wien, Verh. **16**: 521 (logotype: *Delphax hamata* Boheman, 1847, K. Sven. Vet.-Akad., Handl., 45.

54. Dicranotropis cognata Muir.

Dicranotropis cognata Muir, 1917, Hawaiian Ent. Soc., Proc. 3 (4): 317.

DISTRIBUTION: South Pacific, western Caroline Is.

PALAU. Babelthuap: Two males and two females, Ngiwal, Aug. 1951, Gressitt; Ulimang, Dec. 1947, Dybas. Koror: Three males and one female, Nov. 1951, Gressitt, Mar. 1948, Maehler, and Apr., May 1953, Beardsley. Ngarmalk (NW. Auluptagel): One female, 25 m., Dec. 1952, Gressitt.

YAP. Yap: Thirty-five males and 34 females, Kolonia, Kanif, Dugor, Ruul, north and south districts, July-Aug. 1950, Goss; hill behind Yaptown, 50-60 m., Nov., Dec. 1952, Gressitt. Gagil-Tomil: Tomil, July-Aug. 1950, Goss.

Genus **Phyllodinus** Van Duzee

Phyllodinus Van Duzee, 1897, Buffalo Soc. Nat. Sci., Bull. **5**: 240 (haplotype: *Phyllodinus nervatus* Van Duzee, op. cit.).

55. Phyllodinus granulinervis (Stål).

Delphax granulinervis Stål, 1854, Öfv. K. Vet.-Akad., Förh. **11**: 246.

Phyllodinus sauteri Muir appears to be conspecific.

DISTRIBUTION: Formosa, southern Mariana Is., western Caroline Is.

S. MARIANA IS. Saipan: One male, Mt. Tagpochau, 1 mile north-northeast of summit, Jan. 1945, Dybas. Guam: Two males and one female, Pt. Oca, June, Aug. 1945, Bohart and Gressitt.

PALAU. Babelthuap: One male, Ollei, May 1953, Beardsley.

YAP. Yap: Ten males and four females, Kanif, Dugor, north Yap, Tomil. Map: East, July-Aug. 1950, Goss.

CAROLINE ATOLLS. Sonsorol: One male, Sept. 1952, Krauss. Ulithi: Three males and one female, Fassarai I., Oct. 1952, Krauss. Woleai: Eight males and one female, Utagel I., Sept. 1952, Krauss, Feb. 1953, Beardsley; Falalis I., Sept. 1952, Krauss, Feb. 1953, Beardsley. Ifaluk: One male and three females, Ifaluk I., Sept. 1952, Krauss, Feb. 1953, Beardsley. Lamotrek: One male, Lamotrek I., Feb. 1953, Beardsley.

56. Phyllodinus nigromaculosus Muir.

Phyllodinus nigromaculosus Muir, 1917, Hawaiian Ent. Soc., Proc. **3** (4): 317.

DISTRIBUTION: Philippines, western Micronesia.

S. MARIANA IS. GUAM: Two males, Pt. Oca, May 1945, Bohart and Gressitt.

PALAU. BABELTHUAP: Two males, Ulimang, Dec. 1947, Dybas; Ngiwal, Aug. 1951, Gressitt. KOROR: Two males, 25 m., Dec. 1952, Gressitt, June 1953, Beardsley. PELELIU: One female, north central part, July 1944, Dybas. NGAIANGL: Two females, Dec. 1952, Gressitt.

YAP. YAP: Thirteen males and six females, north and south Yap, Kanif, Kolonia and Dugor, July-Aug. 1950, Tomil, Aug. 1950, Goss.

CAROLINE ATOLLS. WOLEAI: One female, Utegal I., July 1946, Townes. ULITHI: One male, Potangeras I., Aug. 1945, Baker.

Genus **Euidellana** Metcalf

Euidellana Metcalf, 1950, B. P. Bishop Mus., Occ. Papers **20** (5): 61 (orthotype: *Euidellana carolinensis* Metcalf, op. cit.).

57. Euidellana carolinensis Metcalf (fig. 28, *a*).

Euidellana carolinensis Metcalf, 1950, B. P. Bishop Mus., Occ. Papers **20** (5): 61.

DISTRIBUTION: Mariana and Caroline Is.

S. MARIANA IS. GUAM: One mutilated specimen and four females, Pt. Oca, July 1945, Bohart and Gressitt.

PALAU. BABELTHUAP: Eight males and eight females, Ulimang, Dec. 1947, Dybas; Ngiwal, Aug. 1951, Gressitt. KOROR: Nine males and nine females, Nov. 1947, Dybas, Jan. 1953, Beardsley; northeast part, July 1946, Townes, Sept. 1952, Krauss. NGERKABESANG: Four males and two females, July 1946, Townes.

YAP. YAP: Seven males and 12 females, Ruul District, July-Aug. 1950, Goss; Oct. 1952, Krauss; hill behind Yaptown, Dec. 1952, Mt. Gillifitz, 150 m., Nov. 1952, Gressitt. MAP: West, July-Aug. 1950, Goss.

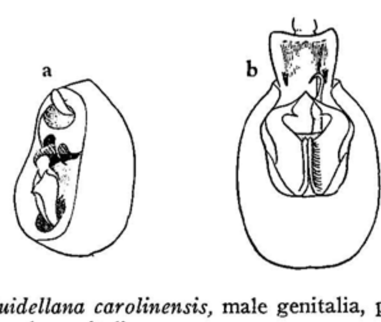


FIGURE 28.—**a**, *Euidellana carolinensis*, male genitalia, posterolateral view; **b**, *Stenocranus agamopsyche*, male genitalia.

CAROLINE ATOLLS. ULITHI: One female, Mogmog, Oct. 1952, Krauss.

PONAPE. Fifty-two males and 71 females: Colonia Airfield, July-Sept. 1950, Adams, Aug. 1946, Townes, Jan. 1953, Clarke, and Jan. 1938, Esaki; Nanpil, Nett District, Feb. 1948, Dybas; Mt. Temwetemwensekir, 180 m., Jan. 1953, Gressitt, Jan. 1953, Clarke; Nanponmal, 50 m., Jan. 1953, Gressitt; Palang, west coast, 15 m., Jan. 1953, Gressitt.

KUSAIE. One female, Lele I., Feb. 1953, Clarke.

Euidellana seems to be nearest to *Dicranotropis,* but it also shows affinity with *Nilaparvata,* which is segregated by the weak "generic" character of the spines on the side of the basal post-tarsal segment. However, of the differences between *Euidellana* and *Dicranotropis* the most striking is the elongate posterior aspect of the pygofer. The depressed vertex is traversed medially by a pale line, whereas in *Dicranotropis* a definite carina is present. In *Euidellana* both segments of the antennae are of equal width throughout; the second is not broader than the first. In *Dicranotropis* the basal segment is conical-cylindrical, distinctly expanding distad, whereas the second segment is wider than the first. *Dicranotropis ucalegon* Fennah (1950, B. P. Bishop Mus., Bull. **202**: 43) is considered congeneric with *carolinensis,* and should be referred to under the new combination *Euidellana ucalegon* (Fennah).

Genus **Stenocranus** Fieber

Stenocranus Fieber, 1866, Zool.-bot. Ges. Wien, Verh. **16**: 519 (logotype, *Fulgora minuta* F., 1787, Mant. Ins. **2**: 262).

58. **Stenocranus agamopsyche** Kirkaldy (fig. 28, *b*).

Stenocranus agamopsyche Kirkaldy, 1906, Hawaiian Sugar Planters' Assoc. Exper. Sta., Ent. Bull. **1** (9): 409.

Stenocranus philippinensis Muir, 1917, Hawaiian Ent. Soc., Proc. **3** (4): 323.

Anal segment of male quadrate-cylindrical, distal margin entire, narrowly deflexed, a short, straight spine on each side ventrally very near base; anal style lanceolate, longer than anal segment. Pygofer moderately long, lateral margins shallowly convex, unarmed; foramen longer in vertical line than broad, ventral margin almost semicircularly rounded, devoid of processes, diaphragm deeply inserted, its dorsal margin sinuately biconvex. Aedeagus tubular, moderately long, porrect caudad, giving off near middle a short curved spine directed ventrad and slightly distad of this, on left, a much longer spine directed caudad, then strongly curved mesad and cephalad: terminal portion of aedeagus straight and very slender. Genital styles large, their mesobasal margins apposed and strongly produced caudad; styles broad at base, flattened, tapering, and diverging distally for two-thirds of their length, then abruptly narrowed and incurved, narrowly tapering mesocaudad after giving off a small tooth on inner margin.

DISTRIBUTION: Philippines, Queensland, southern Mariana Is., western Caroline Is.

S. MARIANA IS. GUAM: Six males and one female, Agana, Oct. 1952, Krauss; Pago Bay, June 1945, Dybas.

PALAU. BABELTHUAP: One male, Ulimang, Dec. 1947, Dybas. KOROR: One male, Nov. 1947, Dybas.

YAP. GAGIL-TOMIL: Two males, Gagil District, July-Aug. 1950, Goss, Oct. 1952, Krauss.

Muir states that *S. philippinensis* "is a Philippine form of *S. agamopsyche* Kirkaldy of Queensland," but that it differs in the form of the genital styles. This is so; and a difference in the shape of the anal segment and anal style (compared with Kirkaldy's figure) is also evident, whereas the aedeagus figured by Kirkaldy is quite distinct.

59. Stenocranus pacificus Kirkaldy.

Stenocranus pacificus Kirkaldy, 1907, Hawaiian Sugar Planters' Assoc. Exper. Sta., Ent. Bull. **3** (1): 139, pl. 15.

DISTRIBUTION: Fiji, western Caroline Is.

PALAU. BABELTHUAP: One female, Ulimang, Dec. 1947, Dybas. KOROR: One male and one female, Apr., May 1953, Beardsley.

The ventral member of the two spines shown at the apex of each genital style in Kirkaldy's figure is obsolete in the above-mentioned male specimen.

Genus **Sardia** Melichar

Sardia Melichar, 1903, Homopteren-Fauna von Ceylon, 96 (haplotype: *Sardia rostrata* Melichar, op. cit.).

60. Sardia pluto (Kirkaldy).

Hadeodelphax pluto Kirkaldy, 1906, Hawaiian Sugar Planters' Assoc. Exper. Sta., Ent. Bull. **1** (9): 313.

Stenocranus carolinensis Metcalf, 1954, Elisha Mitchell Sci. Soc., Jour. **70** (1): 7.

DISTRIBUTION: Ceylon, eastern Australia, New Caledonia, Fiji, Samoa, Tahiti, Philippines, Formosa, western Caroline Is.

PALAU. BABELTHUAP: One mutilated specimen and three females, Ulimang, Dec. 1947, Dybas; Ngiwal, Aug. 1951, Dec. 1952, Gressitt. KOROR: One female, Jan. 1953, Beardsley.

YAP. YAP: One male and two females, 50 m., hill behind Yaptown, Nov. 1952, Gressitt.

CAROLINE ATOLLS. NAMORIK: One male, Sept. 1953, Beardsley.

PONAPE. One male and one female, Agric. Exper. Sta., Colonia, Jan. 1953, Gressitt; Oct. 1953, Beardsley.

KUSAIE. One male, Mwot-Utwe, Dec. 1947, Esaki.

Genus **Chloriona** Fieber

Chloriona Fieber, 1866, Zool.-bot. Ges. Wien, Verh. **16**: 522 (logotype: *Delphax unicolor* Herrich-Schaeffer, 1835, Nom. Ent. **1**: 66).

Subgenus **Sogatella** Fennah

Sogatella Fennah, 1956, California Acad. Sci., Proc. IV, **28** (13): 471 (type: *Delphax furcifera* Horváth).

Head little narrower than pronotum. Vertex slightly longer than broad, its width at base subequal to width of eye in same line, and exceeding two-thirds of its length, apical margin transverse, interrupted by projecting submedian carinae of frons; carinae of vertex and frons slender and distinct; frons longer than broad with median carina forked approximately at level of middle of eyes, lateral margins straight, subparallel. Antennae cylindrical, moderately short, basal segment distinctly longer than broad, second segment longer than first. Length of pronotum and mesonotum combined scarcely as long as maximum width of latter. Pronotum tricarinate, lateral discal carinae almost straight, strongly diverging basad, not reaching hind margin; not parallel with mesonotal carinae; mesonotum tricarinate, longer than vertex and pronotum together. Legs terete, not at all compressed, rather slender; post-tibial calcar with about 20 small teeth; basal segment of post-tarsus devoid of spines along side.

It may be added that the holotype of this species and the holotype of *Delphax vitticollis* Stål, which are strictly congeneric, are in no way related in a generic sense to the holotype of *Sogata dohertyi* Distant, notwithstanding Muir's statement to the contrary (1924, Hawaiian Sugar Planters' Assoc. Exper. Sta., Ent. Bull. **15**: 12). So far as my present knowledge extends, no described species of *Sogata,* other than the type, has been correctly referred to this genus.

61. Chloriona (Sogatella) furcifera (Horváth). (Figure 29, *i-m.*)

Delphax furcifera Horváth, 1899, Term. Füzetek. 22: 372.

The holotype of this species is in the Hungarian National Museum and is from Japan. The median excavation in the dorsal margin of the diaphragm is rectangulate and deeply hollowed out. The genital styles are broad near the base, and the distal processes are subequal in length and relatively short and narrow. Other Japanese specimens show the aedeagus to be distally acute and to bear two rows of teeth, the longer (lateral and ventral) with 19 and the shorter (ventral) with 12.

The vertex is distinctly longer than broad at the base. The color is as follows: head piceous with carinae and antennae pale yellow; pronotum pale yellow, black behind the eyes; mesonotum with disc pale yellow, sides very dark fuscous; tegulae yellow; abdomen piceous. The tegmina are hyaline with a black sublinear mark at the apex of the clavus.

The Micronesian fauna includes a form which strictly agrees.

DISTRIBUTION: Japan, Micronesia.

S. MARIANA IS. GUAM: Two males. Pt. Oca, May 1945, Bohart and Gressitt; Mt. Santa Rosa, June 1945, Bohart and Gressitt.

PALAU. BABELTHUAP: Two males and seven females, Ngiwal, Aug. 1951, Gressitt. KOROR: Two males, Aug. 1952, Beardsley; Sept. 1952, Krauss.

PONAPE. Four males and six females, Colonia, Aug. 1932, Uchiyama.

MARSHALL IS. MAJURO: Three males and two females, Aug. 1946, Townes. JALUIT: Four males and three females, Medyado I., Aug. 1946, Townes.

62. Chloriona (Sogatella) kolophon (Kirkaldy).

"Delphax" kolophon Kirkaldy, 1907, Hawaiian Sugar Planters' Assoc. Exper. Sta., Ent. Bull. **3** (1): 157.

This species differs from the preceding one, which it closely resembles, in the vertex not being longer than broad at base, in the medial emargination

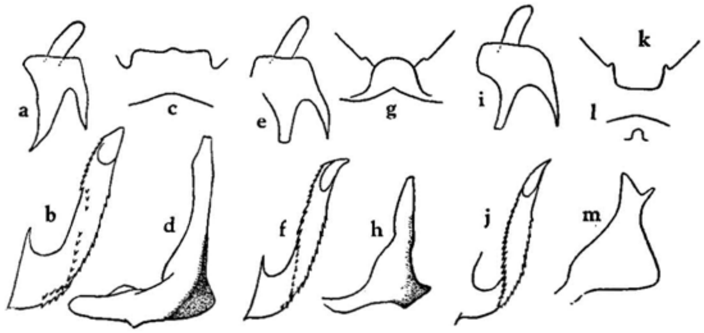


FIGURE 29.—**a-d,** *Chloriona* (*Sogatella*) *euterpe: a,* anal segment of male, side view; *b,* aedeagus; *c,* median area of diaphragm; *d,* genital style. **e-h,** *C.* (*S.*) *eupompe: e,* anal segment of male; *f,* aedeagus; *g,* median area of diaphragm; *h,* genital style. **i-m,** *C.* (*S.*) *furcifera: i,* anal segment of male; *j,* aedeagus; *k,* median area of diaphragm; *l,* medioventral process of pygofer; *m,* genital style.

of the diaphragm being shallowly excavate and with the sides of the excavation not at right angles to the bottom, and in the genital styles being less constricted subapically, the apical process being very unequal, the outer process being very much longer than the inner; moreover, the inner margin of each genital style near the base is not evenly convex almost in one plane, but strongly reflected caudad. The aedeagus is furnished with fewer teeth than is the foregoing species.

DISTRIBUTION: Australia, Philippines, Micronesia.

BONIN IS. One female, July 1912, Kuwana, is tentatively referred to this species.

S. MARIANA IS. SAIPAN: Seventeen males and 28 females, 1 to 2 miles east of Tanapag, Jan. 1945, Dybas; As Mahetog area, Nov., Dec. 1944, and

Jan., Apr. 1945, Dybas. GUAM: Three males. Pt. Oca, Agana, May, June, July 1945, Bohart and Gressitt.

PALAU. BABELTHUAP: One male and one mutilated specimen, Ngiwal, Aug. 1951, Gressitt.

YAP. YAP: Four males, Kanif, July-Aug. 1950, Goss; Oct. 1952, Krauss. MAP: East part, July-Aug. 1950, Goss.

CAROLINE ATOLLS. ULITHI: Three males, Mogmog, Oct. 1952, Krauss; Fassarai, Oct. 1952, Krauss. FAIS: One male, Oct. 1952, Krauss.

TRUK. TON: Three males, Pata, Sabote-Epin, Apr. 1940, Yasumatsu and Yoshimura.

PONAPE. Seven males and two females, Agric. Exper. Sta., Colonia, Jan. 1953, Gressitt; Colonia-Sankakuyama, Dec. 1937 and Jan. 1938, Esaki.

MARSHALL IS. UJELANG: One female, Ujelang I., Oct. 1953, Beardsley. WOTHO: One male, Wotho I., Oct. 1953, Beardsley. UJAE: Twelve males and six females, Ujae I., Oct. 1953, Beardsley. LIB: One male, Oct. 1953, Beardsley. NAMU: Five males and four females, Namu I., Oct. 1953, Beardsley. NAMORIK: Two males, Namorik I., Sept. 1953, Beardsley. EBON: One male and one female, Ebon I., Sept. 1953, Beardsley. MAJURO: One male, June 1950, La Rivers. KILI: One male and one female, Oct. 1953, Beardsley. WOTJE: One female, Oct. 1953, Beardsley.

It has generally been accepted that Muir was correct in his statement (1924, Hawaiian Sugar Planters' Assoc. Exper. Sta., Ent. Bull. **15**: 14) regarding *Sogata furcifera* Horváth that "specimens from the west and northwest Pacific have the apex of the genital style fairly narrow, and the two prongs near together, whereas those from the southwestern Pacific, the American continent and adjoining Atlantic Islands and Africa have the apex much wider and the prongs wider apart. There is also a slight difference in the armature of the diaphragm and in a small projection on the ventral edge of the foramen of the diaphragm. It may be possible to recognize three subspecies, *furcifer, kolophon* and *nigeriensis*." The present collections, however, prove that it is not possible to recognize the first two as geographical subspecies, for they occur side by side in the same locality (Ngiwal). They are either two distinct species or a single species showing wide individual variation. Such individual variation cannot, under the International Code, be given any nomenclatorial recognition. If *C. furcifera* really varies to such an extent within any one population, it is to be expected that other species of *Sogata* will also show much intraspecific variability. But so far no student, including Muir, has been able to record any similar example.

At present, I consider the above species to be distinct and assume that they are living together without interbreeding. It is perhaps worth adding that the figures given by Esaki and Hashimoto (1937, Studies on rice leafhoppers, Min. Agric. and Forest., Japan, **127**: pl. 4), and by Ishihara (1949, Matsu-

yama Agric. Coll., Sci. Rept. **2**: pl. 13, figs. 169-171) are correctly attributed to *furcifera* Horváth. Of the figures given by Muir (1924, Hawaiian Sugar Planters' Assoc. Exper. Sta., Ent. Bull. **15**) number 115 on plate 6 is of *furcifera*. The remainder which are so labeled appear to represent *kolophon* Kirkaldy.

63. Chloriona (Sogatella) formosella (Matsumura).

Unkana formosella Matsumura, 1935, Ins. Matsumurana **10**: 72.

DISTRIBUTION: Formosa, southern Mariana Is., western Caroline Is.

S. MARIANA IS. SAIPAN: One male, one mutilated specimen and one female, 1 to 2 miles east of Tanapag, Jan. 1945, Dybas. GUAM: Two males, Pt. Oca, Agana, May 1945, Bohart and Gressitt.

YAP. YAP: Five males and two females, Kolonia, Kanif, Dugor, north Yap, July-Aug. 1950, Goss.

64. Chloriona (Sogatella) eupompe (Kirkaldy). (Figure 29, *e-h.*)

Delphax eupompe Kirkaldy, 1907, Hawaiian Sugar Planters' Assoc. Exper. Sta., Ent. Bull. **3** (1): 162.

Frons devoid of setae, genae below eyes with four slender setae.

Post-tibial spur armed with 10 to 13 teeth. Diaphragm of pygofer with upper margin not incised at laterodorsal angles of heavily sclerotized median armature, at most with a very shallow indentation.

DISTRIBUTION: Australia, south Pacific.

S. MARIANA IS. SAIPAN: Sixteen males and 14 females, June 1951, R. Bohart; As Mahetog area, Nov. 1944, Feb., Apr. 1945, Dybas. GUAM: One male, Pt. Oca, June 1945, Bohart and Gressitt.

PALAU. KOROR: Eleven males and eight females, July 1946, Oakley.

CAROLINE ATOLLS. WOLEAI: Three males, Utegal I., Feb. 1953, Beardsley.

65. Chloriona (Sogatella) euterpe Fennah, n. sp. (fig. 29, *a-d*).

Frons with lateral margins very slightly curved, diverging in basal two-thirds, parallel in distal third, lateral margins projecting laterad, median carina simple, prominent, disc evenly beset with short minute setae; vertex scarcely twice as long as broad, mediolateral carinae arising in basal third and meeting at apex, Y-shaped carina very feeble, but present. Frons meeting vertex roundly through an angle of 80 degrees. Post-tibial calcar with about 23 teeth.

Dark fuscous; median carina of frons, more especially near base, a broad band from apex of vertex to apex of mesoscutellum, not quite filling pronotal disc, antennae, apex of clypeus, rostrum and legs, pallid stramineous, last two occasionally suffused fuscous.

Anal segment of male with two stout spines on apical margin, directed ventrad, closely approximated. Pygofer long throughout, anal emargination deep, laterodorsal angles obtuse but very distinct, diaphragm with dorsal margin strongly and narrowly indented at each side of medial armature; armature with dorsal margin shallowly sinuate. Genital styles approximately L-shaped, directed dorsad and tapering in their distal half, with a dark heavily sclerotized eminence where their bases are apposed (in posterior view). Aedeagus slightly compressed laterally, weakly tapering distally, orifice on right at apex, about 12

teeth dorsally near apex, a linear tract of 10 to 14 teeth in an oblique line on right and a line of 15 teeth from middle ventral line subapically to left side near base.

Male: length 2.3 mm., tegmen 2.9 mm.

Holotype, male (US 62139), Pt. Oca, Guam, south Mariana Is., May, June 1945, Bohart and Gressitt. Six males and two females, Mt. Santa Rosa, June 1945 and Pt. Oca, May, June 1945, Bohart and Gressitt.

PALAU. BABELTHUAP: One male, 25 m., Ngaremeskang, Dec. 1952, Gressitt. KOROR: Eight males and two females, southwest, 25 m., Dec. 1952, Gressitt; Apr., Sept. 1953, Beardsley.

YAP. YAP: Fourteen males, one mutilated specimen, and three females, Colonia, Kanif, south and north Ruul District, July-Aug. 1950, Goss; hill behind Yaptown, Nov., Dec. 1952, Gressitt. RUMUNG: East part, Goss. MAP: East, south, and west, Goss. GAGIL-TOMIL: July-Aug. 1950, Goss.

DISTRIBUTION: Southern Mariana Is., western Caroline Is. (Yap, Palau).

This species is remarkably like *C.* (*S.*) *eupompe*. It differs in profile of head, in the more distinct Y-shaped carina, which is not developed in *eupompe*, in the greater number of teeth on the post-tibial spur, in the more prominent laterodorsal angles of the pygofer, in the shape of the armature of the diaphragm and the shape of the genital styles, and in the ornamentation of the aedeagus. In coloration the principal difference lies in the darker clypeus and lower lateral pronotal fields of *euterpe*, but this is not constant. The tegmina of the Guam specimen are colored as in *eupompe* from Saipan, whereas those of the Yap series are distinctly more transparent. There does not, however, appear to be any indication of the existence of a graded *Rassenkreis*. The break in all differing characters is just as pronounced between *eupompe* from Saipan and *euterpe* from Guam as between the former and *euterpe* from Yap.

The broad genitalic resemblances between the two species—extending, with the exception of the armature and the genital styles, to *C.* (*S.*) *furcifera*—may be found to be characteristic of all species of the subgenus. Such a pattern does not occur in the type species of *Chloriona* (*C. unicolor* Herrich-Schaeffer), nor does the striking color pattern of the body.

66. Chloriona (Sogatella) kyusyuensis (Matsumura and Ishihara).

Sogata kyusyuensis Matsumura and Ishihara, 1945, Mushi **16** (10) : 65.

DISTRIBUTION: Japan, western Caroline Is.

YAP. YAP: One female, July-Aug. 1950, Goss, is provisionally assigned to this species on color characters.

67. Chloriona (Sogatella) geranor (Kirkaldy).

Delphax geranor Kirkaldy, 1907, Hawaiian Sugar Planters' Assoc. Exper. Sta., Ent. Bull. **3** (1) : 158.

The anal segment of the male is distinctly quadrispinose; and the apices of the basal pair closely invest the sides of the aedeagus.

DISTRIBUTION: Queensland, western Micronesia.

S. MARIANA IS. SAIPAN: One male, Kanoa, Jan. 1949, Maehler.

PALAU. KOROR: Five males and one female, Nov., Dec. 1947, Dybas; Jan. 1953, Beardsley.

YAP. YAP: Four males, Aug. 1952, Krauss. GAGIL-TOMIL: Gagil, July-Aug. 1950, Goss.

68. Chloriona (Sogatella) paludum (Kirkaldy).

Kelisia paludum Kirkaldy 1910, Fauna Hawaiiensis **2** (6) : 579.

DISTRIBUTION: Hawaii, Micronesia.

S. MARIANA IS. TINIAN: Two males, south and north, June 1946, Townes. GUAM: Three males and one female, Pt. Oca, July 1945, Mar. 1945, Bohart and Gressitt; Pago Bay, June 1945, Dybas.

PALAU. BABELTHUAP: One female, Ngiwal-Ngarard, Aug. 1939, Esaki. KOROR: Three males, in southwest, Dec. 1952, Gressitt, Sept. 1952, July 1953, Beardsley. PELELIU: One male, Aug. 1945, Dybas.

YAP. Thirteen males and two females. YAP: Hill behind Yaptown, Dec. 1952, Gressitt; Dugor, south Yap, Goss. MAP: July-Aug. 1950, Goss. GAGIL-TOMIL: Tomil, 1950, Goss.

CAROLINE ATOLLS. WOLEAI: Two males and one female, Falalis, Feb. 1953, Beardsley, Sept. 1952, Krauss; Utegal, Feb. 1953, Beardsley, FARAULEP: One male, Faraulep, Feb. 1953, Beardsley. SATAWAL: One male, Sept. 1952, Krauss. SATAWAN: One male and one female, More, Nov. 1952, Beardsley. NAMA: One male, Feb. 1949, Potts. LOSAP: One male, Losap I., Oct. 1952, Beardsley. NUKUORO: Three males and one female, Aug. 1946, Townes. KAPINGAMARANGI: Nine males and five females, Aug. 1946, Townes. PINGELAP: One male, Jan. 1953, Gressitt.

TRUK. Five males and one female. WENA (Moen): 180 m., July 1946, Townes. PIS: I., July 1946, Townes. TON: Pata, Sabote-Epin, Apr. 1940, Yasumatsu and Yoshimura; Olej, Apr. 1940, Yasumatsu and Yoshimura.

PONAPE. A single female from Ponape, Colonia, Agric. Exper. Sta., on cacao, Jan. 1953, Gressitt (tentatively assigned to this species).

KUSAIE. One brachypterous male, Lele I., 100 m., Mar. 1953, Clarke.

MARSHALL IS. UJAE: One male, Ujae, Oct. 1953, Beardsley. LAE: One male, Lae., Oct. 1953, Beardsley. KWAJALEIN: Six males, Lui I., Feb. 1945, Wallace. JALUIT: Three males, Medyado I., Aug. 1946, Townes. MAJURO: Nine males, Aug. 1946, Townes. ARNO: Four males and three females, Ine I., June 1950, Usinger; Aug. 1950, La Rivers.

GILBERT IS. TARAWA: One male, Mar. 1951, Catala.

69. Chloriona fieberi (Muir). (Figure 30, *a-e*.)

Kelisia fieberi Muir, 1917, Hawaiian Ent. Soc., Proc. **3** (4) : 331.

DISTRIBUTION: Philippines, Ceylon, western Micronesia.

S. MARIANA IS. SAIPAN: Eighty-one males and 72 females, As Mahetog area, Oct., Nov., Dec. 1944, Jan., Apr., May 1945, Dybas.

PALAU. KOROR: One male, Apr. 1953, Beardsley.

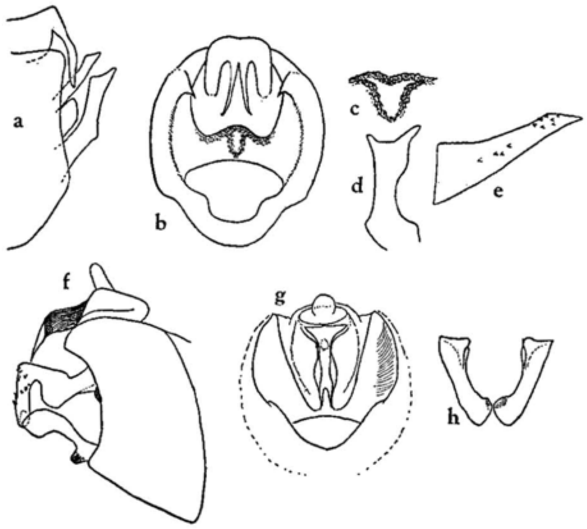


FIGURE 30.—**a-e**, *Chloriona fieberi: a,* male genitalia, left side; *b,* anal segment and pygofer; *c,* armature of diaphragm; *d,* genital style, posterior view; *e,* aedeagus, left side (tooth on extreme left and lower four of apical group on right side of aedeagus, here shown by transparency). **f-h**, *Delphacodes lyraeformis: f,* male genitalia, right side; *g,* anal segment and diaphragm of pygofer, posterior view; *h,* genital styles, posterior view.

YAP. YAP: Two males, north Yap, July 1950; Ruul District, July-Aug. 1950, Goss.

70. Chloriona albotristriata (Kirkaldy).

This is a tentative identification requiring confirmation. (See Swezey, 1946, B. P. Bishop Mus., Bull. **189**: 154; Guam.)

71. Chloriona ochrias (Kirkaldy).

This is a tentative identification requiring confirmation. [See Swezey, 1946, B. P. Bishop Mus., Bull. **189**: 153 (*Liburnia ochrias*); Guam.]

Genus **Nilaparvata** Distant

Nilaparvata Distant, 1906, Fauna of India **3**: 473 (orthotype: *Nilaparvata greeni* Distant, op. cit. = *Delphax lugens* Stål).

72. Nilaparvata lugens (Stål).

Delphax lugens Stål, 1854, Öfv. K. Vet.-Akad., Förh. **11**: 246.

DISTRIBUTION: Southeast Asia, south Pacific.

PALAU. BABELTHUAP: One male and three females, Ngarard, Aug. 1939, Esaki; Ngiwal, Aug. 1951, Gressitt.

YAP. GAGIL-TOMIL: One male, Gatzapar, Gagil, Sept. 1939, Esaki.

Genus **Delphacodes** Fieber

Delphacodes Fieber, 1866, Zool.-bot. Ges. Wien, Verh. **16**: 524 (logotype: *Delphax mulsanti* Fieber, op. cit., p. 526).

73. **Delphacodes propinqua** (Fieber).

Delphax propinqua Fieber, 1866, Zool.-bot. Ges. Wien, Verh. **16**: 525.

Delphacodes shirozui Ishihara, 1949, Matsuyama Agric. Coll., Sci. Repts. 2: 53.

DISTRIBUTION: Japan, Philippines, western Micronesia.

S. MARIANA IS. SAIPAN: Ninety-four males and 62 females, 2 km. east of Tanapag, As Mahetog area, Talofofo ridge, Dec. 1944, Jan., Apr., May 1945, Dybas. TINIAN: One male, June 1946, Townes. GUAM: Six males, Pt. Oca, Agana, May, June, July 1945, Bohart and Gressitt.

PALAU. KOROR: Five males, Nov. 1947, Dybas; 25 m., Dec. 1952, Gressitt; Jan., Apr., June 1953, Beardsley. PELELIU: One male, July 1945, Dybas.

YAP. YAP: Oct. 1952, Krauss. GAGIL-TOMIL: Six males, Gagil, July-Aug. 1950, Goss.

74. **Delphacodes matanitu** (Kirkaldy).

Delphax matanitu Kirkaldy, 1907, Hawaiian Sugar Planters' Assoc. Exper. Sta., Ent. Bull. **3** (1): 155.

Post-tibial spur with about 17 teeth.

Pygofer with armature of diaphragm strongly laterally compressed, extending dorsocaudad, acute at apex, black and polished. Aedeagus with orifice terminal, bounded by a swelling below and a narrow strongly projecting lip above.

DISTRIBUTION: Queensland, south Pacific.

S. MARIANA IS. SAIPAN: One male, As Mahetog area, Apr., May 1945, Dybas.

PALAU. ANGAUR: One male, Feb. 1948, Dybas.

YAP. YAP: Three males, Ruul, Kanif, July-Aug. 1950, Goss; Oct. 1952, Krauss.

75. **Delphacodes striatella** (Fallen).

Delphax striatella Fallen, 1826, Hemipt. Sveciae **2**: 75.

Post-tibial spur with about 17 teeth.

Pygofer with armature of diaphragm black, polished, relatively large, conical with apex directed caudad. Aedeagus strongly curved dorsad then caudoventrad, cylindrical, orifice terminal, with upper lip drawn out into a slender spine.

DISTRIBUTION: Europe, Philippines, Micronesia.

PALAU. KOROR: One male, Sept. 1952, Beardsley.

YAP. YAP: Three males, Kanif. MAP: North and south, all July-Aug. 1950, Goss.

MARSHALL IS. MAJURO: Nine males, Aug. 1946, Townes.

76. Delphacodes lyraeformis (Matsumura). (Figure 30, *f-h.*)

Liburnia lyraeformis Matsumura, 1900, Ent. Nachr. **26**: 267.

DISTRIBUTION: Japan, southern Mariana Is., western Caroline Is.

S. MARIANA IS. SAIPAN: Three males, Sadog Talofofo, Feb. 1945, Dybas. GUAM: Two males, Pt. Oca, June 1945; NAMRU-2, July 1945, Bohart and Gressitt.

YAP. YAP: One male, Kolonia, Mar. 1954, Beardsley.

CAROLINE ATOLLS. PULO ANNA: One male, Sept. 1952, Krauss. SONSOROL: Two males, Sept. 1952, Krauss. NGULU: Five males, Ngulu I., Oct. 1952, Krauss. ULITHI: Three males, Fassarai I., Oct. 1952, Krauss. WOLEAI: Four males, Falalis, Sept. 1952, Krauss; Utegal I., Feb. 1953, Beardsley. IFALUK: Two males, Ifaluk I., Feb. 1953, Beardsley. LAMOTREK: One male, Lamotrek I., Feb. 1953, Beardsley.

77. Delphacodes albicollis (Motschulsky).

Delphax albicollis Motschulsky, 1863, Soc. Nat. Moscou, Bull. **36**: 110.

DISTRIBUTION: Europe, Caucasus, Turkey, Palestine, Canary Is., Madagascar, Ceylon, Philippines, Japan.

S. MARIANA IS. GUAM: One male, Pt. Oca, July 1945, Bohart and Gressitt.

PALAU. KOROR: One male, Arabaketsu, May 1938, Murakami.

YAP. YAP: One male, hill behind Yaptown, 50 m., Dec. 1952, Gressitt.

78. Delphacodes amblystylis Fennah, n. sp. (fig. 31, *a, b*).

Vertex a little longer than broad, carinae meeting in middle at apex, frontal carina distinct; lateral pronotal carinae not quite reaching hind margin, antennae with first segment scarcely twice as long as broad, about half as long as second segment, post-tibial calcar with 16 or 17 teeth.

Brachypterous form: dark castaneous, polished; rostrum and legs testaceous: tegmina fuscous piceous.

Anal segment deeply sunk in excavation of pygofer, very short, lateroapical angles widely separated, each produced ventrad in a short stout curved spine, apical margin transverse. Pygofer ringlike, anal foramen subcircular, dorsolateral angles rectangulate, deflexed, ventrolateral angles produced in a short subacute lobe; diaphragm rather broad, produced caudad and more heavily sclerotized near middle, dorsal margin thickened, sinuate, shallowly excavate medially. Aedeagus with a short sinuately tapering process arising dorsally at margin of orifice, directed caudad. Genital styles broad at base directed dorsocaudad, then abruptly narrowed and directed dorsolaterad, widening to apex which is rounded, upper margin obtusely angulate a little before apex.

Male (brachypterous): length 2.1 mm.; *female* (brachypterous): length 2.5 mm.

Holotype, male (US 62143), and one female from Guam, Mariana Is., Pt. Oca, May, 1945, Gressitt and Bohart.

This species resembles a *Pissonotus* or *Anectopia,* but differs from both in the number of teeth on the post-tibial calcar, from *A. mandane* Kirkaldy and *A. atrata* Muir it differs in the structure of the genitalia. From other species of *Delphacodes* known to me it differs in the shape of the male genitalia.

DISTRIBUTION: Southern Mariana Is. (Guam).

79. Delphacodes marpessa Fennah, n. sp. (fig. 31, *c*).

Vertex very little longer than broad rounding into frons, carinae united at apex; frons with lateral margins shallowly convex, widest at level of lower margin of eyes: antennae with basal segment scarcely twice as long as broad, more than half length of second segment, pronotum with lateral carinae not reaching hind margin; post-tibial calcar with 20 small even teeth along margin, apex of tibiae five-spined, basal metatarsal joint seven-spined, second metatarsal four-spined.

Brachypterous form: castaneous piceous; rostrum and legs testaceous stramineous.

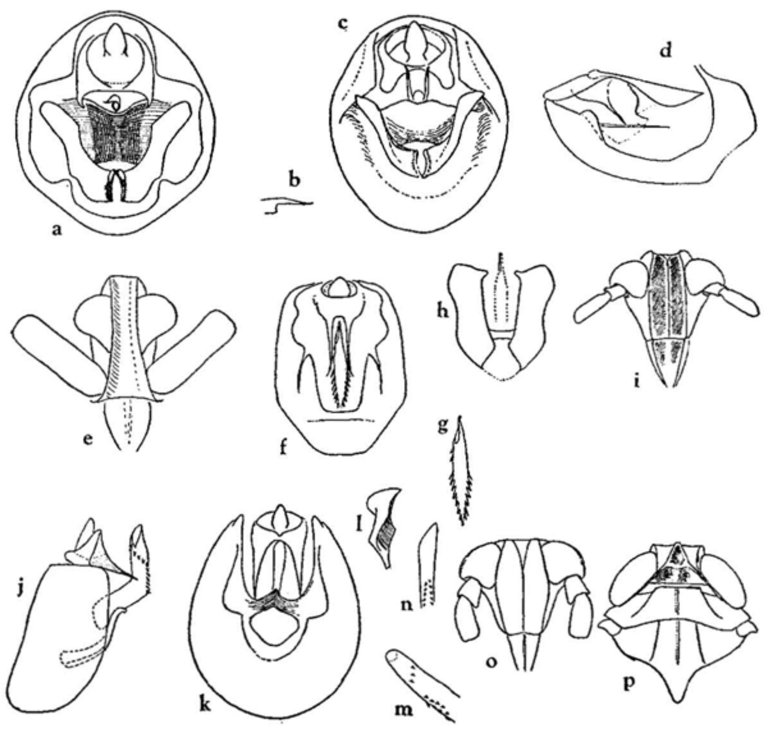


FIGURE 31.—**a, b,** *Delphacodes amblystylis: a,* male genitalia, posterior view; *b,* apex of aedeagus, left side. **c,** *D. marpessa,* male genitalia, posterior view. **d,** *Lamenia flavescens,* aedeagus, right side. **e,** *L. flava,* frons and clypeus (*d* and *e* from Philippine species and figured here for comparison). **f-j,** *Delphacodes thersander: f,* male genitalia, posterior view, genital styles omitted; *g,* aedeagus, posterior view; *h,* genital styles, posterior view, relative position of aedeagus indicated by broken line; *i,* frons and clypeus; *j,* male genitalia, left side. **k-p,** *D. celaeno: k,* male genitalia, posterior view, genital styles omitted; *l,* genital style; *m,* aedeagus, right side; *n,* aedeagus, ventral view; *o,* frons and clypeus; *p,* head and thorax.

Anal segment very short, deeply immersed in dorsal excavation of pygofer, apical margin very slender, horizontal, lateroapical angles each feebly produced in a subtriangular lobe. Pygofer ringlike, much longer ventrally than dorsally, lateral and ventral posterior margins devoid of processes; foramen a little broader than long, laterodorsal angles subrectangulate or obtuse, inflected mesad, ventral margin excavate: diaphragm broad, dorsal margin shallowly biconvex, surface devoid of ornamentation. Aedeagus short, tubular, slightly expanded distally, a small pointed projection at middle of ventral margin and a moderately long blade-like process on each side directed caudad. Genital styles moderately long, inner margin shallowly concave, outer margin shallowly convex near base and shallowly concave distally, apical margins convex-truncate, apical angles bluntly rounded.

Male (brachypterous) : length 2.1 mm.; *female* (brachypterous) : length 2.6 mm.

Holotype, male, allotype (US 62142), and one brachypterous female and one mutilated specimen, Yap I., Yap group, Oct. 1952, Krauss.

In superficial appearance this species is not unlike *Anectopia atrata* Muir. The genitalia are quite unlike those of any other species known to me. They resemble those of *Delphacodes pseudonigripennis* Muir in general outline and shape of styles, but differ greatly in shape of anal segment and of diaphragm.

DISTRIBUTION: Western Caroline Is. (Yap).

80. Delphacodes thersander Fennah, n. sp. (fig. 31, *f-j*).

Vertex in dorsal view as long as broad, basal compartment pentagonal, its median carina obsolete, sublateral carinae meeting at apex, so that frons is unicarinate almost from base, frons longer than broad, lateral margins shallowly convex. Antennae reaching to level of frontoclypeal suture, basal segment about twice as long as broad, and about two-thirds of length of second segment. Lateral carinae of pronotum not reaching posterior margin. Post-tibiae laterally bispinose, apically five-spined, post-tibial spur with nine stout teeth, basal metatarsal segment distally seven-spined, second segment four-spined. Tegmina with Sc+R forked slightly basad of Cu_1 fork, both distinctly basad of level of junction of common claval vein with sutural margin.

Stramineous; intervals between carinae of frons and clypeus sometimes infuscate; abdominal sclerites, except along hind margin, and genitalia fuscous. Tegmina hyaline with faint yellowish suffusion, veins concolorous, distally yellowish brown.

Anal segment small, short, ringlike with a pair of slender spines, slightly separated at their base, directed ventrad. Pygofer with foramen U-shaped, anal emargination broad, laterodorsal angles rounded-rectangulate, diaphragm with pigmented portion U-shaped, the median area narrow and transverse, the lateral lobes broad, narrowing dorsad and acutely rounded apically. Aedeagus tubular, laterally compressed, abruptly bent dorsad near middle, orifice ovate, on left at apex, two teeth on dorsal margin close to apex, three teeth leading from these obliquely across left side to a paired series of seven stout teeth latero-ventrally, these teeth terminating basally at point of flexure of aedeagus. Genital styles moderately long, of subequal width throughout, in posterior view inner margin almost straight, outer weakly sinuate-convex, dorsal margin oblique, outer distal angle broadly rounded, inner angle produced in a short peglike lobe.

Holotype, male (US 63142), Truk: Civil Administration area, Moen [Nantaku, Wena], Feb. 1, 1949, Potts; one male, Satawal I., Feb. 6, 1953, Beardsley.

In general shape the genital styles slightly resemble those of *Sogata heitensis* Matsumura and Ishihara, but the shape of the foramen of the pygofer and of the laterodorsal angles is different.

DISTRIBUTION: Eastern Caroline Is. (Truk).

81. Delphacodes celaeno Fennah, n. sp. (fig. 31, *k-p*).

Vertex broader than long, smoothly and steeply rounding into frons immediately distad of transverse carina, median carina feeble but present, V-shaped carinae at base of median carina of frons rather elongate but not reaching beyond middle of eyes in anterior view, frons longer than broad, lateral margins shallowly convex, median carina distinct on frons, feeble on clypeus. Antennae extending as far as level of frontoclypeal suture, basal segment short, scarcely longer than broad, a little more than half length of second segment. Pronotum with lateral carinae not reaching posterior margin. Forelegs not compressed, post-tibiae laterally two-spined, apically five-spined, post-tibial spur foliaceous with 17 minute teeth laterally, basitarsus distally seven-spined, second post-tarsal joint three-spined. Tegmina with veins granulate, Sc+R forked slightly basad of Cu_1 fork, the latter level with entry of claval vein into sutural margin.

Fuscous piceous; carinae of vertex and frons, mesonotum except for two spots basally outside lateral carinae, femora and tibiae at apex, and tarsi sordid testaceous, posterior half of pronotum and tegulae ivory white. Tegmina hyaline, veins concolorous.

Anal segment of male deeply sunk in anal emargination of pygofer, short, ringlike, with each laterodistal angle strongly produced into a long tapering spinose lobe directed ventrad. Pygofer with orifice relatively small, U-shaped, dorsolateral angles shortly and subacutely produced; diaphragm narrow, dorsal margin biconcave, median area dark, tectiform, and polished. Aedeagus with distal portion porrect dorsocaudad, slightly tapering distad, slightly laterally compressed basad, an oblique row of three short teeth on right side toward apex, and about a dozen teeth ventrally near middle line rather more basad; orifice terminal, oblique. Genital styles narrow in basal half, directed dorsolaterad, angulately bent mesodorsad at middle and each expanded distally with outer margin deeply convex, and inner apical angle acute.

Holotype, male (US 63143), Utegal I., Woleai Atoll, Feb. 3, 1953, Beardsley.

This species is not unlike a *Phyllodinus* in the shape of the head, but it differs substantially from *Phyllodinus, Dicranotropis,* and *Anectopia* in the shape of the fork of the median carina, in the number of teeth on the calcar, and in numerous other details. Its present location may have to be reconsidered when the genera of Delphacidae are revised.

DISTRIBUTION: Caroline atolls (Woleai).

82. Delphacodes dryope (Kirkaldy).

This identification requires confirmation. (See Swezey, 1946, B. P. Bishop Mus., Bull. **189**: 154; Guam.)

Genus **Coronacella** Metcalf

Coronacella Metcalf, 1950, B. P. Bishop Mus., Occ. Papers **20** (5): 59 (orthotype: *Coronacella bella* Metcalf, op. cit.).

83. Coronacella kirkaldyi (Muir), new comb.

Delphax puella Kirkaldy (*nec* Van Duzee), 1907, Hawaiian Sugar Planters' Assoc. Exper. Sta., Ent. Bull. **3** (1): 160.

Kelisia kirkaldyi Muir, 1917, Hawaiian Ent. Soc., Proc. **3** (4): 329.

Coronacella bella Metcalf, 1950, B. P. Bishop Mus., Occ. Papers **20** (5): 59.

DISTRIBUTION: Queensland, Philippines, Formosa, Micronesia, Fiji, Samoa, Tahiti.

S. MARIANA IS. SAIPAN: One male and three females, Nov. 1944, Apr. 1945, Dybas. GUAM: Fifteen males and 21 females, Pt. Oca, Agana, May, July, Sept. 1945, Bohart and Gressitt; Mt. Santa Rosa, Dec. 1945, Bohart and Gressitt; Talofofo, Aug. 1952, Krauss; Fadang, June 1945, Dybas.

PALAU. KOROR: Three males and one female, Nov. 1947, Dybas; Sept. 1952, Krauss; southwest Koror, 25 m., Dec. 1952, Gressitt.

YAP. YAP: Seven males and three females, central and south parts, July-Aug. 1950, Goss; hill behind Yaptown, 50 m., Dec. 1952, Gressitt, Oct. 1952, Krauss. MAP: July-Aug. 1950, Goss. RUMUNG: East part, July-Aug. 1950, Goss.

CAROLINE ATOLLS. SATAWAL: One male, Feb. 1953, Beardsley.

TRUK. Five males and two females. WENA (Moen): Civil Administration area, Mar. 1949; Chukumong, Feb. 1949, Potts; 30 m., July 1946, Townes. TON: Pata, Sabote, Apr. 1940, Yasumatsu and Yoshimura; Olej-Foup, Apr. 1940, Yasumatsu and Yoshimura.

PONAPE. Sixteen males (one brachypterous) and nine females, Mt. Beirut, 660 m.; Tolenot Pk., 200 m.; Peipalap Pk., July-Sept. 1950, Adams; Colonia, Hydroelectric Station, Aug. 1946, Townes, Sept. 1953, Beardsley; Ronkiti-One, July 1939; Reitao-Ona, July 1939, Esaki; Palang, 15 m., Jan. 1953, Gressitt.

KUSAIE. Two males and five females, Malem, Dec. 1937, Esaki; Mwot-Utwe, Dec. 1937, Esaki.

MARSHALL IS. NAMORIK: One male and two females, Namorik I., Sept. 1953, Beardsley. MAJURO: Five males and 19 females, Majuro I., Uliga I., June 1950, La Rivers; Oct. 1952, Beardsley.

FAMILY MEENOPLIDAE FIEBER

KEY TO ORIENTAL GENERA OF MEENOPLIDAE (ADAPTED FROM MUIR)

1. Frons with a distinct median carina.......... **Phaconeura** Kirkaldy
   Frons devoid of a median carina.......... 2

2 (1). Clypeus devoid of lateral carinae.......... **Nisia** Melichar
   Clypeus with lateral carinae distinct.......... 3

3 (2). Tegmina greatly broadened apically, usually with eight or nine apical areoles.......... **Kermesia** Melichar
   Tegmina not greatly broadened apically, usually with seven apical areoles.......... **Suva** Kirkaldy

Genus **Nisia** Melichar

Nisia Melichar, 1903, Homopteren-Fauna von Ceylon, 53 (haplotype: *Meenoplus atrovenosus* Lethierry, 1888, Mus. Civ. Stor. Nat. Genova, Ann. II, **6**: 466).

84. Nisia atrovenosa (Lethierry).

Meenoplus atrovenosus Lethierry, 1888, Mus. Civ. Stor. Nat. Genova, Ann. II, **6**: 466.

DISTRIBUTION: Old World tropics.

S. MARIANA IS. GUAM: Three females, Ordot, May 1945 and Pt. Oca, May-July 1945, Bohart and Gressitt.

PALAU. BABELTHUAP: Three males, seven females, and one mutilated specimen, Ulimang, Dec. 1947, Dybas; Ngeremeskang, 30 m., Dec. 1952, Gressitt; Ngiwal, Sept. 1951, 1 m., Dec. 1952, Gressitt; Ngatpang, 65 m., Dec. 1952, Gressitt; Ngarumisukan-Kaishar, Aug. 1939, Esaki. KOROR: Four males and nine females, southwest, 25 m., Dec. 1952, Gressitt, Dec. 1952, Apr., May 1953, Beardsley; Arabaketsu, Dec. 1937, Murakami. PELELIU: One male, July 1945, Dybas.

YAP. Ten males, 27 females, and one mutilated specimen. YAP: Kolonia, Ruul District, July-Aug. 1950, Goss, Sept. 1939, Esaki; Kanif, July 1945, Goss; hill behind Yaptown, 60 m., Nov. 1952, Gressitt; Dugoi, July-Aug. 1950, Goss, in humus, 10 m., Nov. 1952, Gressitt; 50 m., Dec. 1952, Gressitt. MAP: South part, July-Aug. 1950, Goss. GAGIL-TOMIL: Tomil, 1950, Goss.

This species has been previously reported from Guam by Swezey (B. P. Bishop Mus., Bull. **189**: 155, 1946).

FAMILY DERBIDAE SPINOLA

KEY TO TRIBES OF DERBIDAE

1. Tegmina long and relatively narrow; wings reduced or not more than half length of tegmina, with cubital and anal areas greatly reduced 2
   Tegmina not very long; wings almost invariably more than half length of tegmina, with cubital and anal areas not reduced 3

2 (1). Eyes in front not reaching to base of clypeus; subcostal cell long, sometimes very narrow .... **Zoraidini**
   Eyes in front reaching to base of clypeus; subcostal cell very short or absent .... **Sikaianini**

3 (1). Tegmina with veins of Cu_1 reaching hind margin; clavus closed distally, or if narrowly open then claval vein reaching no farther than last cubital vein 4
   Clavus open distally; tegmina with veins of Cu_1 not reaching hind margin but meeting produced claval vein, which extends to last apical cell .... **Otiocerini**

4 (3). Cu in tegmen with four or more veins reaching hind margin (*Zeugma* Westwood) Australasian, Philippine .... **Derbini**
   Cu in tegmen with less than four veins reaching hind margin 5

5 (4). Cu in tegmen simple or branched, reaching margin direct, not joining with basal median sector .... **Cenchreini**
   Cu in tegmen joined with basal median sector for some distance forming a polygonal or rhomboidal cell; sometimes a triangular cell near base of first median sector; tegmina broad .... **Rhotanini**

TRIBE ZORAIDINI

KEY TO AUSTRALASIAN AND PACIFIC GENERA OF ZORAIDINI

1. Antennae shorter than frons, arista apical, one to three cubital veins reaching hind margin, valvulae of ovipositor reduced or absent.................. 2
Antennae as long as face or longer, arista subapical, four to six cubital veins reaching hind margin, valvulae of ovipositor not reduced..................10

2 (1). Tegmina with none of the sectors of M forked.................. 3
Tegmina with second or third sector of M forked.................. 6

3 (2). Head as wide as thorax or wider..................**Lydda** Westwood
Head narrower than thorax.................. 4

4 (3). Basal cell of media narrow; wings about half as long as tegmina, rounded at apex 5
Basal cell of media broad; wings much less than half as long as tegmina, acute at apex..................**Diostrombus** Uhler

5 (4). Second segment of antennae at least three times as long as broad.................. **Shizuka** Matsumura
Second segment of antennae short, about twice as long as broad.................. **Proutista** Kirkaldy

6 (2). Head in profile rounded at apex, not conically produced between eyes.................. 7
Head in profile conically produced..................**Helcita** Stål

7 (6). Vertex longer in middle line than broad across base; rostrum with apical segment regularly cylindrical, not distinctly broader than apex of subapical segment 8
Vertex broader across base than long in middle line; rostrum with apical segment asymmetrically produced on one side, markedly broader than apex of subapical segment..................**Monochorhynchus** Muir

8 (7). Tegmina with Sc+R forked near base; wings acute at apex..................**Neocamma** Melichar
Tegmina with Sc+R forked near or distad of middle; wings rounded at apex 9

9 (8). Second antennal segment with a triangular subspinose flange laterally near apex..................**Acanthocerana** Metcalf
Second antennal segment not furnished with a process....**Pamendanga** Distant

10 (1). Vertex broader than long, frons wide, antennae large, flat. (*Shirakiana* Matsumura belongs here, but the frons is very narrow between the eyes) ....**Peggia** Kirkaldy
Vertex not broader than long, frons narrow or linear..................11

11 (10). Tegmina with hind margin produced between apex of clavus and cubital veins 12
Hind margin of tegmina not so produced, serrate..................**Losbañosia** Muir

12 (11). Head in profile produced conically before eyes..................**Pseudohelcita** Muir
Head in profile rounded, not conically produced..................13

13 (12). Pronotum with posterior margin transverse..................**Neodiostrombus** Muir
Pronotum with posterior margin angulately excavate..................**Zoraida** Kirkaldy

Genus **Zoraida** Kirkaldy

Zoraida Kirkaldy, 1900, Entomologist **33**: 242 (orthotype: *Derbe sinuosa* Boheman, 1838, K. Sven. Vet.-Akad., Handl. **58**: 225).

85. **Zoraida pterophoroides fistulator** Fennah, n. subsp. (fig. 32, *d-f*).

Antennae approximately 1.3 times length of frons, tegmina about 2.1 times as long as wings, venation as figured.

Stramineous, dorsally tinged orange, ventrally more pallid and sometimes faintly tinged pale green; mesonotum, carinae excepted, more or less fuscous, abdomen with a dark fuscous vitta on each side of middle, anal segment of male, upper margin of pygofer and upper (apical) margin of genital styles fuscous. Tegmina hyaline, a suffusion across base, very weak in costal cell and very intense along inner (mesonotal) margin of clavus, a broad band overlying subcostal and radial cells to apex giving off a small projection

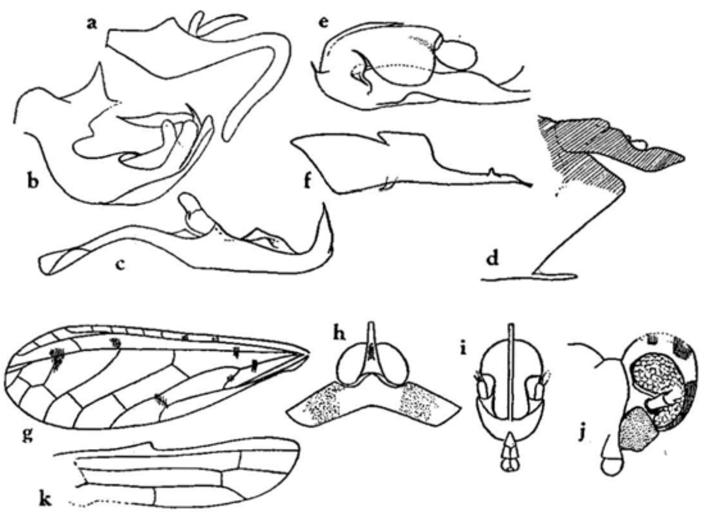


FIGURE 32.—**a-c**, *Proutista moesta: a*, anal segment of male; *b*, aedeagus; *c*, genital style. **d-f**, *Zoraida pterophoroides fistulator: d*, anal segment and pygofer; *e*, aedeagus; *f*, genital style. **g-k**, *Sikaiana palaui: g*, tegmen; *h*, vertex and pronotum; *i*, frons and clypeus; *j*, head in profile (dorsal margin reconstructed); *k*, wing.

over first fork of M, and another, larger, at middle of tegmen, and a third at the subapical row of cross veins, fuscous; veins Sc and R and sometimes M distally reddish, other veins fuscous. Wings lightly infuscate, veins fuscous.

Pygofer moderately long, laterodorsal angles subacute, lateral margins oblique, straight, medioventral process very large, triangulate. Anal segment moderately short, porrect caudad, anal foramen at middle. Aedeagus tubular, feebly sclerotized and pigmented, a small spine on right dorsal margin at apex, directed obliquely upward, flagellum with a spine arising dorsally, directed cephalad; right side of flagellum expanded in a

deeply rounded lobe, flagellum terminating apically in a small subovate lobe minutely denticulate on its distal margin. Genital styles very narrow at base, each with a small triangular lobe on its dorsal margin; each style distally expanded into a trapezoidal lobe with a shallow lobe, in the form of an elongate ridge, projecting from its dorsal margin; apical margin oblique; ventrally a stout strongly sclerotized hook-shaped process.

Male: length 5.0 mm., tegmen 11.8 mm., wing 5.6 mm.

Holotype, male (US 62204), Babelthuap, Palau Is., Ulimang, Dec. 21, 1947, Dybas. One mutilated male from Koror, Palau Is., July 20, 1951, Gressitt.

DISTRIBUTION: Western Caroline Is. (Palau).

The genitalia of the type of *Z. pterophoroides* (Westwood), (1851, Ann. Mag. Nat. Hist. II, **7**: 210, *Derbe*), or of topotypic material from Ceylon, do not appear to have been described. The present material, as far as its superficial characters are concerned, differs comparatively little from the description. It differs from Distant's figure (Fauna of India, Rhync. **3**: 301) in having one apical vein fewer in the R-M region and from his description in not having a series of dark spots in a row overlying the veins of R and M which reach the apex; it differs also in the presence of three fuscous suffusions extending mesad from the submarginal anterior fuscous band. These differences cannot yet be fully evaluated, but there is no doubt that the Palau Island populations of this *Zoraida* form a unit distinct from the Ceylon population and require taxonomic recognition.

Genus **Proutista** Kirkaldy

Proutista Kirkaldy, 1904, Entomologist **37**: 279 (orthotype: *Derbe moesta* Westwood, 1851, Ann. Mag. Nat. Hist. II, **7**: 209).

86. Proutista moesta (Westwood). (Figure 32, *a-c.*)

Derbe (*Phenice*) *moesta* Westwood, 1851, Ann. Mag. Nat. Hist. II, **7**: 209.

DISTRIBUTION: Indonesia, Philippines, Formosa, Japan, western Micronesia.

S. MARIANA IS. TINIAN: One female, ridge 1 mile north of Tinian Harbor, on sugar cane, Mar. 1945, Dybas. ROTA: Four males and one female, Teteto-Sonson, Sept. 1937, Esaki. GUAM: Fifteen males and 20 females. Pt. Oca, May 1945, Bohart and Gressitt, May, June 1945, Dybas; Agana, May 1945, Bohart and Gressitt, May 1945, Gressitt; Tumon Bay, Feb. 1948, Maehler; Mt. Santa Rosa, May 1945, Gressitt; Jan.-Apr. 1945, Baker; Mogmog, Jan. 1953, Clarke; 1 mile southeast of Asan, Jan.-Apr. 1945, Baker.

PALAU. KOROR: One male, July 1953, Beardsley.

CAROLINE ATOLLS. LOSAP: Two males and two females, Pis, Oct. 1952, Beardsley. NOMWIN: One female, Fananu, Feb. 1954, Beardsley.

TRIBE SIKAIANINI

KEY TO AUSTRALASIAN AND PACIFIC GENERA OF SIKAIANINI

1. Tegmina with Cu united with M for some distance from base....**Distantinia** Muir
   Tegmina with Cu arising from base, not united with M; basal cell of media present 2

2 (1). Basal cell of media broad and short, not reaching to middle of tegmen........ 3
   Basal cell of media very narrow, reaching to about middle of tegmen........ **Leomelicharia** Muir

3 (2). Antennae much shorter than head and thorax combined, cylindrical, slightly constricted near middle........**Sikaiana** Distant
   Antennae as long as head and thorax combined, or nearly so....**Muiria** Kirkaldy

Genus **Sikaiana** Distant

Sikaiana Distant, 1907, Ann. Mag. Nat. Hist. VII, **19**: 398 (orthotype: *Sikaiana hyalinata* Distant, op. cit.).

87. Sikaiana palaui Fennah, n. sp. (fig. 32, *g-k*).

Post-tibiae eight-toothed at apex, basal metatarsal segment four-toothed, second metatarsal segment with a tooth at each side apically. Wings one-third length of tegmina.

Pallid, powdered white; two spots on sides of head above eyes, a suffusion on side of head before eyes near frontoclypeal suture, dark fuscous or reddish fuscous; clypeus, rostrum, pronotum outside disc, pleurites, and legs testaceous with fuscous tinge; mesonotum laterally yellowish brown. Tegmina milky hyaline, numerous small spots along costal margin and veins from Sc to margin scarlet red; three short transverse stripes near base of tegmen, a suffusion over all forks of M, over all cross veins, and over all veins near margin, fuscous. Wings milky hyaline.

Pregenital sternite generally W-shaped with median lobe broadly convex. Valvulae of ovipositor short and broad, the outer valvulae subauriculate.

Female: length 1.9 mm., tegmen 3.8 mm.

Holotype, female (US 62158), Peleliu, Palau Is., east coast, Aug. 1, 1945, Dybas.

DISTRIBUTION: Western Caroline Is. (Palau).

This species is distinguished from *S. makii* Muir, *S. vitriceps* Muir, *S. fulva* Muir, and *S. straminea* Muir by the length of the wings in relation to the tegmina; from *S. nesiope* Kirkaldy and *S. hyalinata* Distant in tegminal venation; and from all these as well as from *S. caenosa* Muir, *S. nigrimaculata* Muir, and *S. clymene* Kirkaldy in coloration.

Genus **Muiria** Kirkaldy

Muiria Kirkaldy, 1907, Hawaiian Sugar Planters' Assoc. Exper. Sta., Ent. Bull. **3** (1): 175 (haplotype: *Muiria stridula* Kirkaldy, loc. cit.).

88. Muiria palauana Fennah, n. sp. (fig. 33, *a-e*).

Dull ochraceous yellow. A spot on upper lateral margin of second antennal segment, pronotum on disc and hind margin, carinal lines of mesonotum and posterior half of disc, including scutellum, and most of pygofer and genital styles white hyaline. A spot on sides of head above eyes, a suffusion over rostrum, fore and middle legs and post femora, and a spot at apex of tarsi, a spot laterally on abdomen at base, and anal style orange red.

Abdomen dorsally reddish fuscous, pale in middle line and interruptedly along hind margins of each sclerite. Tegmina vitreous, costal margin orange red; a row of elongate spots in costal cell, cell Sc, and a suffusion overlying first two sectors of M dark grayish fuscous; veins yellow or concolorous except M distally, which is red. Wings very small, vitreous, suffused dull yellow at base and in distal third.

Anal segment of male, short, tubular, about half as long as anal style. Pygofer with dorsolateral angles distinctly and subacutely produced, rounded at apex. Aedeagus short, tubular, ascending, reflected distally in a short thick densely fimbriate process, which is overlain on its left side basally by a thin sclerotized subovate plate, which is produced distally in two short spinose processes, the upper process bent mesad then laterad near tip, the lower incurved mesad.

Genital styles rather short and broad, widest near apical margin, in side view with ventral margin basally concave, distally convex, apical margin rounded-oblique, dorsal margin straight, ascending from base to dorsal apical angle, which is a little produced and knoblike; a stout ledge exteriorly from base to apex just below dorsal margin, projecting strongly beyond apical margin in a club-shaped process flattened on its mesal face; a slender curved process arising near base of style dorsally on inner face, directed dorsocaudad then bent at middle laterocephalad.

Male: length 2.4 mm., tegmen 5.0 mm.

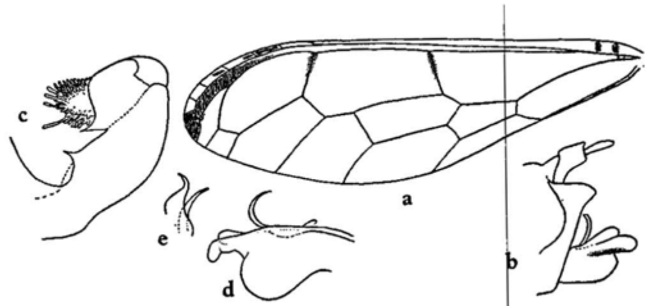


FIGURE 33.—*Muiria palauana:* **a**, tegmen; **b**, male genitalia, left side (aedeagus not shown); **c**, aedeagus, left side; **d**, genital style, ventrolateral view; **e**, dorsal view of spinose processes of genital style.

Holotype, male (US 63144), Koror, Palau Is., Mar. 1954, Beardsley.

DISTRIBUTION: Western Caroline Is. (Palau).

This species differs from *M. stridula* Kirkaldy in tegminal venation, in the more quadrate anterior lobe of the wing, and in the shape of the anal segment of the male and of the genital styles. From *M. iridescens* Muir it differs in the pattern of dark markings on the tegmina and in the shape and relative size of the anal segment, as well as in size.

TRIBE OTIOCERINI

KEY TO AUSTRALASIAN AND PACIFIC GENERA OF OTIOCERINI

1.	Media not arising from radius or arising basad of Sc+R fork	2
	Media separating from R distad of Sc+R fork	27
2 (1).	First median sector arising before apical third of tegmen	3
	Median sectors confined to apical third of tegmen	21

3 (2). First segment of antennae short, at most as wide as long 4
First segment of antennae more than twice as long as broad 20
4 (3). Sc+R fork at or basad of middle of tegmen, subcostal cell long 5
Sc+R fork distad of middle of tegmen, subcostal cell short 18
5 (4). Subantennal process and lateral keels of pronotum absent or very small 6
Subantennal process well developed 12
6 (5). Head in profile not angulate at junction of vertex and frons, latter not wider at base than at apex 7
Head in profile angulate at apex or frons wider at base than at middle 10
7 (6). Margin of head in profile subparallel to eye, head not markedly produced 8
Margin of head in profile not subparallel to eye, head distinctly produced before eyes 9
8 (7). Head produced before eyes for two-thirds length of eye; antennae cylindrical arising from a thin deep collar near base of clypeus; ocelli absent .... **Eusyphax***
Head much less produced before eyes; antennae not articulated near clypeus; ocelli present .... **Pyrrhoneura** Kirkaldy
9 (7). Antennae not reaching as far as apex of head (female) .... **Swezeyia** Kirkaldy
Antennae reaching as far as apex of head .... **Kuranda** Distant
10 (6). Frons at base at least as wide as at apex, head in profile produced before eyes .... **Swezeyia** Kirkaldy
Frons at base narrower than at apex 11
11 (10). Vertex in profile sinuous .... **Kampulokara** Muir
Vertex in profile not sinuous .... **Kamendaka** Distant
12 (5). Lateral carinae of pronotum absent or reduced 13
Lateral carinae of pronotum well developed 15
13 (12). Vertex and frons in profile rounded, vertex not ascending distad .... **Nesocore** Kirkaldy
Vertex in profile ascending distad 14
14 (13). Vertex in profile curved upward and backward .... **Nesoniphas** Kirkaldy
Vertex in profile curved upward but not backward .... **Nesoneura** Kirkaldy, subgenus of **Pyrrhoneura**
15 (12). Subantennal process spatulate, attached to gena by a slender stalk 16
Subantennal process not spatulate, broadly attached to gena 17
16 (15). Head considerably produced before eyes .... **Kaha** Kirkaldy
Head not considerably produced before eyes .... **Nesokaha** Muir
17 (15). Lateral carinae of frons not contiguous, vertex truncate at apex .... **Flaccia** Stål
Lateral carinae of frons contiguous, vertex acutely angular or notched at apex .... **Paralyricen** Muir
18 (4). Head in profile angulate at junction of vertex and frons 19
Vertex in profile curving into frons, not angulate at junction .... **Makula** Distant
19 (18). Costal margin entire .... **Kamendaka** Distant
Costal margin more or less sinuous, interrupted by an angular projection; a distinct area between costa and margin in basal third of tegmen .... **Banksiella** Muir
20 (3). Subantennal process absent .... **Dendrokara** Melichar
Subantennal process present .... **Neodendrokara** Muir
21 (2). Vertex twice as long as pronotum and mesonotum combined .... **Vivaha** Distant
Vertex not so long 22
22 (21). Tegmina with subcostal cell short, antennae large 23
Tegmina with subcostal cell long, Sc+R fork basad of level of claval apex 24

23 (22). Vertex produced before eyes for nearly twice length of an eye........................ **Epotiocerus** Matsumura
Vertex produced before eye for scarcely length of an eye......**Leptaleocera** Muir

24 (22). Head in profile angulate or narrowly rounded at junction of vertex and frons, produced before eye for more than width of an eye........................ **Interamma** Walker
Head in profile with vertex curving into frons, not produced before eyes for so much as width of an eye........................25

25 (24). Head as wide as thorax or nearly so, vertex truncate at apex, lateral carinae of frons very large, not contiguous on frons.............**Megatropis** Muir
Head narrower than thorax, vertex triangular, lateral carinae of frons large, contiguous on frons........................26

26 (25). Antennae elongate, cylindrical; vertex projecting strongly before eyes; tegmina with apical margin rounded-truncate; M with three equal sectors basad of distal cross veins........................**Nicerta** Walker
Antennae short, ovoid; vertex little projecting before eyes; tegmina with apical margin rounded-oblique; M with two unequal sectors basad of distal cross veins........................**Paralyricen** Muir

27 (1). Subantennal process absent or very small........................28
Subantennal process present........................**Mysidioides** Matsumura

28 (27). Antennae longer than frons........................29
Antennae shorter than frons........................30

29 (28). Tegmina with clavus very narrowly open, Sc and R dilated at apex, vertex elongate, mesonotum with a vertical flange on line of each obsolete lateral carina........................**Anomaladerbe** Muir
Tegmina not as above; vertex relatively short; mesonotum without vertical laminae on lateral carinae........................**Platocera** Muir

30 (28). Antennae with second segment cylindrical; frons wider at apex than at base, which is linear........................**Heronax** Kirkaldy
Antennae with second segment branched near base, appendage strongly curved; frons at least as wide at base as at apex................**Harpanor** Fennah

Genus **Platocera** Muir

Platocera Muir, 1913, Hawaiian Sugar Planters' Assoc. Exper. Sta., Ent. Bull. 12 (1) : 60 (orthotype: *Platocera annulipes* Muir, op. cit.).

In the original description of the genus the antennae are described as "very large, flat, thin, subequal in width throughout, truncate at apex, conspicuously angulately bent at base, forming a disk-like base at right angles to distal portion." The antennae of the species described below differ in the last character. Apart from this, the species agrees with the general habit of *Platocera.* If one may judge from the antennal condition found in dried specimens of *Patara* Westwood, in which the second segment is flat and thin, whereas in life it is perfectly cylindrical, the antennae of living *Platocera* may be expected to present an appearance quite different from that described and possibly also differing a little between sexes.

89. **Platocera calypso** Fennah, n. sp. (fig. 34, *a-d*).

Antennae of male, in dried material, about a fifth longer than frons, flat, thin, parallel-sided, rounded-truncate at apex; antennae of female flat, thin, parallel-sided, abruptly trun-

cate at apex, attaining level of upper margin of eye. Vertex in female not so ascending as in male. Clypeus with disc curved, finely but distinctly laterally carinate, ecarinate medially.

Pallid stramineous; clypeus, except laterally at base, fuscous piceous; antennae apically in male, mesonotal disc on each side at base, and sometimes laterad of disc, postfemora in basal third and a faint transverse band near middle and at apex of protibiae, and a faint stripe along inner surface of profemora light grayish fuscous. Tegmina and wings hyaline with veins testaceous.

Pygofer short, dorsolateral angles triangularly produced, margins below these straight and vertical, a small shallow convex eminence inside lateral margin near its ventral end; posterior ventral margin of pygofer shallowly subangulately convex. Anal segment short with anal foramen occupying almost whole of upper surface, lateroapical angles each produced in a long decurved tapering lobe almost, but not quite, pointed at apex. Aedeagus tubular, a very stout spine at apex on left directed cephalad and overlying flagellum, on upper side of base of this spine a shorter and much more slender spine directed obliquely upward; flagellum rather short, moderately pigmented, comprising two limbs, one above the other: the ventral subtubular, stout, sinuate, twisted on its axis, and minutely pointed at apex, the dorsal thin, vertical, triangular, expanding distally; its upper and lower distal

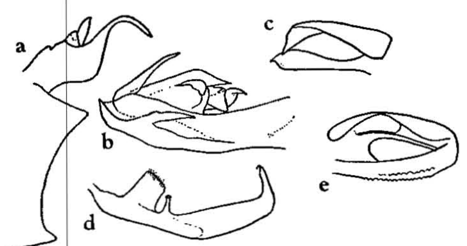


FIGURE 34.—**a-d,** *Platocera calypso: a,* anal segment and pygofer; *b,* aedeagus; *c,* processes on left side of flagellum; *d,* genital style. **e,** *Kamendaka* (*Nicertoides*) *jokaji,* sketch of aedeagus, lateral view.

angles unequally acute, and a short broad lobe on right at apex directed laterad. Genital styles long, distally shallowly upcurved and sinuately tapering to tip; a small triangular lobe at middle of ventral margin and just basad of it a very shallow ledge-like convex lobe; dorsal margin near basal third bearing a pigmented vertical peg, about four times as long as broad; basad of this a broad quadrate lobe, beset with sparse setae, its distal margin oblique and densely setigerous.

Male: length 3.5 mm., tegmen 6.2 mm.; *female:* length 3.1 mm., tegmen 6.0 mm.

Holotype, male (CM), Ngergoi (Garakayo), Palau Is., Aug. 7, 1945, Dybas; one female, same data. Babelthuap: Three males, Ngeremeskang, 25 m., Dec. 1952, Gressitt, Ngatpang, 65 m., Dec. 1952, Gressitt; Aimeliik, Apr. 1954, Beardsley.

DISTRIBUTION: Western Caroline Is. (Palau).

This species is apparently fairly close to *P. albipennis* Muir from Formosa but differs slightly in coloration and profoundly in the detailed structure of the pygofer and anal segment.

A female from Peleliu, Palau Islands (Aug. 30, 1945, Dybas), belongs to this species; but it may represent a distinct subspecies, as the mesonotum is pallid on the disc, with the usual pair of dark fuscous marks basally and testa-

ceous and fuscous laterally, forming a more contrasting color pattern than that in the preceding two specimens.

Genus **Heronax** Kirkaldy

Heronax Kirkaldy, 1906, Hawaiian Sugar Planters' Assoc. Exper. Sta., Ent. Bull. **1** (9) : 431 (orthotype: *Heronax parnassius* Kirkaldy, loc. cit.).

This genus is separated from *Mysidioides* by the presence, in the latter, of a large subantennal plate-like process. Some, if not most, species of *Heronax* have a more or less distinct prolongation of the margin of the antennal collar; but to judge from material so far studied, this is unlikely to be confused with the evident structure found in *Mysidioides*.

90. Heronax achilles Fennah, n. sp. (fig. 35, *a-g*).

Vertex and frons in profile both convex, slightly angulate at point of junction. Clypeus almost as long as frons.

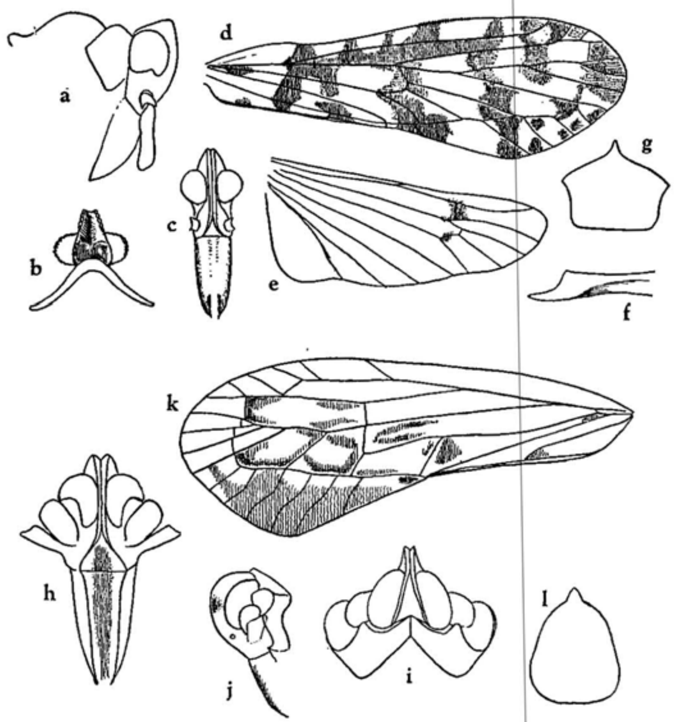


FIGURE 35.—**a-g**, *Heronax achilles: a,* head, pronotum, and dorsal profile of mesonotum, right side; *b,* head and pronotum, dorsal view; *c,* frons and clypeus; *d,* tegmen; *e,* wing; *f,* pregenital sternite, side view; *g,* pregenital sternite, ventral view. **h-l**, *Paralyricen soranus: h,* frons and clypeus; *i,* vertex and pronotum; *j,* head in profile; *k,* tegmen; *l,* pregenital sternite of female.

Pallid stramineous; an oblique band across sides of clypeus, clypeus at apex and rostrum at apex, a narrow line on lower side of profemora and mesofemora distally, two transverse bands on each tibia, and abdominal sclerites feebly at sides yellowish brown. Tegmina hyaline, traversed by five irregular pale fuscous bands, the distal band interrupted in M; each apical cell infuscate at margin. Veins pale. Wings hyaline, lightly clouded fuscous over R-M cross vein and Cu_1 fork, veins pallid.

Anal segment of female short, much broader than long, lateroapical angles broadly rounded. Pregenital sternite irregularly pentagonal; broader than long, distal margin broadly produced caudad, and at middle further produced caudad in a short acutely triangular process, which in profile appears subaculeate.

Female: length 2.8 mm., tegmen 4.3 mm.

Holotype, female (US 62207), Koror, Palau Is., Nov. 19, 1947, Dybas.

DISTRIBUTION: Western Caroline Is. (Palau).

This species differs from *H. dubia* (Muir) in having one sector fewer in M and in the obsolete subantennal process; from *H. maculipennis* (Melichar) in coloration, relative length of tegmina, and different position of the venal furcation; from *H. infuscata* (Distant) in venation; and from *H. rubrinervis* (Distant), *H. juno* (Distant), and *H. pallescens* (Distant) in coloration; from *H. parnassius* Kirkaldy, *H. saccharivora* Kirkaldy, and *H. lalokensis* Muir in the form of the pregenital sternite; and from the last two in the shape of the head in profile and from *H. wollastoni* Distant in tegminal venation and color pattern.

91. Heronax sp.

There is a very distinctively colored mutilated specimen in the collection represented by only the tegmina, wings, mesonotum, and one hind leg. These suffice to show that it is probably congeneric with *Platocera* or *Heronax,* but the coloring can be compared only with that of *Heronax juno* (Distant). It is not greatly unlike that of *Tempora boninensis* Matsumura, but the two are widely separated by tegminal venation. The tegmina are fuscous, with the cells of the corium distinctly paler, cell Cu_{1a} hyaline in part. The hind margin of the clavus and a part of Sc are tawny yellow, the claval veins are testaceous, but the remaining venation is scarlet. The wings are lightly infumed, powdered bluish gray, with red veins.

One specimen from Babelthuap, Palau Is. (Ngiwal, Aug. 7-15, 1951, Gressitt) was taken on wood of a dead coconut palm.

Genus **Paralyricen** Muir

Paralyricen Muir, 1913, Hawaiian Sugar Planters' Assoc. Exper. Sta., Ent. Bull. 12 (1) : 52 (orthotype: *Paralyricen jepsoni* Muir, 1913, op. cit., p. 53).

92. Paralyricen soranus Fennah, n. sp. (fig. 35, *h-l*).

Vertex in dorsal view narrowly triangular, minutely notched in middle at apex, lateral margins not thickened. Antennae of female subovoid, distally subtruncate except for a short conical eminence at one side of distal margin.

Stramineous, powdered white: a small spot on sides of head in front of eyes, a suffusion between eyes and frontoclypeal suture, and disc of frons and clypeus fuscous; lateral margins of vertex narrowly tinged red or orange. Tegmina hyaline, powdered white, a spot in angle at union of claval veins, a spot in broadest part of cell Cu_1 in corium, a small spot distad of apex of clavus, and a faint submarginal lining to most of subapical cells fuscous; apical margin red. Wings hyaline, powdered white, veins concolorous or nearly so.

Pregenital sternite of female long, convex ventrad, subtriangular when viewed from below with lateral margins curved; a small triangular process medially at apex.

Female: length 3.8 mm., tegmen 6.0 mm.

Holotype, female (US 62167), Babelthuap, Ulimang, Palau Is., Dec. 21, 1947, Dybas. One female, Babelthuap, Palau Is., wooded peak southwest of Ulimang, Dec. 20, 1947, Dybas.

DISTRIBUTION: Western Caroline Is. (Palau).

This species is distinguished by tegminal coloration and by the shape of the pregenital sternite.

Genus **Flaccia** Stål

Flaccia Stål, 1866, Hemipt. Africana **4**: 193 [logotype: *Lyricen imthurni* Kirkaldy, 1907, Hawaiian Sugar Planters' Assoc. Exper. Sta., Ent. Bull. **3** (1): 173].

93. **Flaccia dione** Fennah, n. sp. (fig. 36, *a-g*).

Vertex narrowing distally, shortly truncate at apex, where there is a feeble transverse carina, disc only feebly hollowed out. Lateral carinae of frons narrowly but distinctly separated at base, contiguous in middle or practically so, thence strongly diverging distad, disc of frons in facial view reaching to level of lower margin of eyes. Tegmina 2.7 times as long as broad at widest part, apical margin not sinuate.

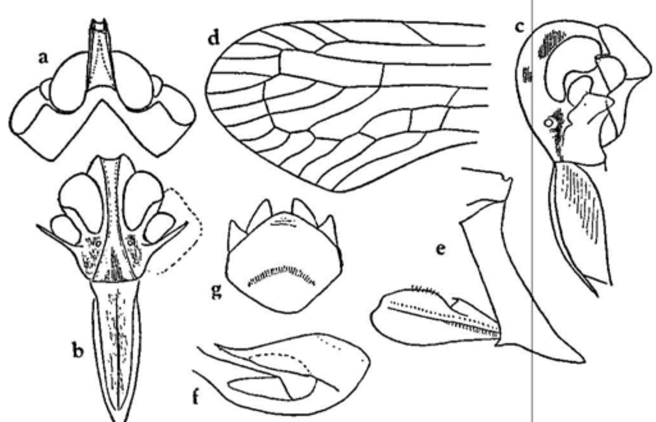


FIGURE 36.—*Flaccia dione:* **a**, vertex and pronotum; **b**, frons and clypeus; **c**, head in profile; **d**, apex of tegmen; **e**, pygofer and genital style; **f**, aedeagus; **g**, pregenital sternite.

Stramineous; a faint suffusion below eye and on disc of frons and clypeus; rostrum, protarsi, and abdomen marginally fuscous. Tegmina translucent with sordid-yellow suffusion, a short stripe in costal cell at base and at middle, base of clavus, except veins, a series of six unequal spots in V-formation beginning at Sc+R+M fork and lying obliquely across to hind margin of clavus near its apex and then returning to M near nodal line, distad of nodal line, main stem of M, Cu_{1a}, and subapical cross veins fuscous. Wings hyaline, powdered white, veins infuscate.

Pygofer with dorsolateral angles obtusely pointed, not produced. Aedeagus tubular, narrowed basally, distally shallowly curving to right, then recurving to left, with distal part curved cephalad and mesad above base.

Genital styles rather short, expanding distally, in profile with an eminence dorsally at basal third bearing a small spine directed laterad, a broader and shallowly convex eminence distad of this margin, apical margin short, sinuately biconvex.

Pregenital sternite broader than long, with anterior and posterior margins broadly convex: a shallow transverse sulcus in basal half.

Male: length 3.7 mm., tegmen 6.0 mm.; *female:* length 3.6 mm., tegmen 6.0 mm.

Holotype, male (US 62166), Ine I., Arno Atoll, Marshall Is., July 28, 1950, La Rivers.

CAROLINE ATOLLS. PINGELAP: One male and five females, Jan. 1953, Gressitt. MOKIL: Three males and four females, Jan. 1953, Gressitt.

KUSAIE. One hundred and twenty-three males and 81 females. Lele I., Aug. 1945, Oakley, Jan. 1938, McCall, and Nov., Dec. 1937, Esaki; Mutunlik, 22 m., Jan., Feb., Mar. 1953, Clarke and Jan. 1953, Gressitt; Malem River, 90 m., Feb. 1953; Pukusrik, 1 m., Apr. 1953; "Hill 541," Apr. 1953, Clarke.

MARSHALL IS. AILINGLAPALAP: Eight males and nine females, Bigatyelang, Aug. 1946, Townes. NAMORIK: One male, Namorik I., Sept. 1953, Beardsley. JALUIT: Twelve males and 24 females, Imrodj, Aug. 1946, Townes, Aug. 1946, Oakley, on coconuts, Apr. 1938, McCall; Elizabeth I., Sept. 1953, Beardsley. MAJURO: Sixty-seven males and 55 females, Majuro village, Aug. 1948, Townes; Oct. 1953, Beardsley. ARNO: Fifty-four males and nine females, Ine I., July 28, 1950, La Rivers. MILI: One male, Alu I., Oct. 1953, Beardsley.

DISTRIBUTION: Eastern Caroline Is. (Kusaie, Mokil, Pingelap), Marshall Is.

This is the first species of the genus reported outside the Fiji Islands. It differs from all others in the shape of the head, in the shape of the tegminal margin, and in both male and female genitalia.

Genus **Kamendaka** Distant

Kamendaka Distant, 1906, Fauna of India **3**: 310.

Subgenus **Nicertoides** Matsumura

Nicertoides Matsumura, 1910, Die schädlichen und nützlichen Insekten vom Zuckerrohr Formosas, 14 (haplotype: *Nicertoides saccharivora* Matsumura, op. cit.).

94. Kamendaka (Nicertoides) jokaji Fennah, n. sp. (fig. 34, *e*).

Stramineous; margins of vertex and sides of head above eyes purplish; a short transverse stripe across base of mesoscutellum and two stripes along profemora and mesofemora fuscous; two spots laterally on metathorax and abdominal tergites and pygofer except posteroventrally yellowish fuscous; mesonotum laterally and in middle of disc yellow. Tegmina hyaline, thinly powdered white; three broad oblique fasciae, the first overlying clavus at base, the second from apex of clavus to basal quarter of costal margin, and the third from middle of costal margin to anal angle of tegmen, where it is joined by a broad band from apical margin at Sc and overlying subapical cells in their distal half, yellow and in basal part of tegmen narrowly edged fuscous; veins concolorous except near subapical cross veins, where they are orange red. Wings hyaline, thinly powdered white, veins concolorous, R and M distad of cross vein faintly yellowed.

Pygofer of moderate length, longer ventrally, lateral margins convex, slightly concave at point of curvature into ventral margin; ventral margin convex, produced medially in a scooplike process about two-fifths as long as genital styles, this process directed obliquely upward and expanded before its middle, lateral portions of this expansion directed dorsad in a rectangulate lobe, distad of this, whether viewed from below or in profile, process tapering to narrowly rounded apex. Anal segment narrow, as long as genital styles, porrect caudad, its lateral margins parallel in basal three-quarters, converging to deeply rounded apex in apical quarter, anal foramen near apex. Genital styles long, in profile narrow basally, then broadened and curved evenly dorsad; a triangular process projecting mesad from dorsal margin at basal third bearing near its base a curved spine directed dorsad and terminating in a short curved spine; slightly distad of this, on ventral margin, a larger and similar lobe, with its curved apical spine parallel to that of the preceding; at apex of styles a very slender and acute spine directed mesad. Aedeagus long, subangulately tubular with lower margins minutely and evenly denticulate; a thin rounded subtriangular vertical plate dorsally on right near apex; flagellum about three-quarters length of basal portion, directed cephalad and slightly to right, comprising a long spine below, directed cephalad and apparently attached for half its length, and a narrow curved lobate process above, also directed cephalad, and curving downward slightly near apex.

Male: length 2.3 mm., tegmen 3.5 mm.

Holotype, male (US 62168), Sokehs (Jokaj) I., Ponape, Feb. 26, 1948, Dybas. Two males and one female, Colonia, Dec. 1937, Jan. 1938, Esaki; Jokaj I., Feb. 1948, on roadside vegetation, Dybas.

DISTRIBUTION: Eastern Caroline Is. (Ponape).

This species differs from Matsumura's figure of *N. saccharivora* Matsumura in the arrangement of the distal tegminal veins and in the porportionate length of the cells, whereas Muir's description of the male genitalia (Hawaiian Ent. Soc., Proc. **3**: 48, 1914) makes no mention of the spinose processes of the genital styles described above.

Subgenus **Eosaccharissa** Kirkaldy

Eosaccharissa Kirkaldy, 1907, Soc. Ent. Belgique, Ann. **51**: 126 (haplotype: *Eosaccharissa javana* Kirkaldy, op. cit.).

Ona Metcalf, 1954, Elisha Mitchell Sci. Soc., Jour. **70** (1): 12 (orthotype: *Ona perplexa* Metcalf, loc. cit.).

95. Kamendaka (Eosaccharissa) lar Fennah, n. sp. (fig. 37, *a-f*).

Pallid, faintly stramineous, powdered white; a mark on sides of head before eyes, extending across narrow frons, and abdominal tergites fuscous. Tegmina hyaline, thinly

powdered white; a curved band from base of clavus over fork of Cu_1 to stigma and membrane posterior to a line from claval apex to first apical cell of M faintly dull yellow; a small mark near middle of costal margin, first apical cell of Sc, R and first three apical cells of M grayish fuscous; veins yellow, tinged orange distally. Wings hyaline, powdered white, veins pale.

Pygofer short, dorsolateral angles abruptly rounded but only very feebly produced, ventral margin convex, slightly produced. Aedeagus tubular, slightly curved upward, of subequal width throughout, divided into two equal lobes distally by a deep median cleft, each lobe acutely pointed at apex: flagellum narrow and straight, very shallowly trough-like, a moderately long sinuate spine arising at base of flagellum and lying along its right side, a markedly longer spine arising at base of flagellum on left side, porrect cephalad and curved mesad at its tip, which reaches nearly to apex of flagellum. Genital styles

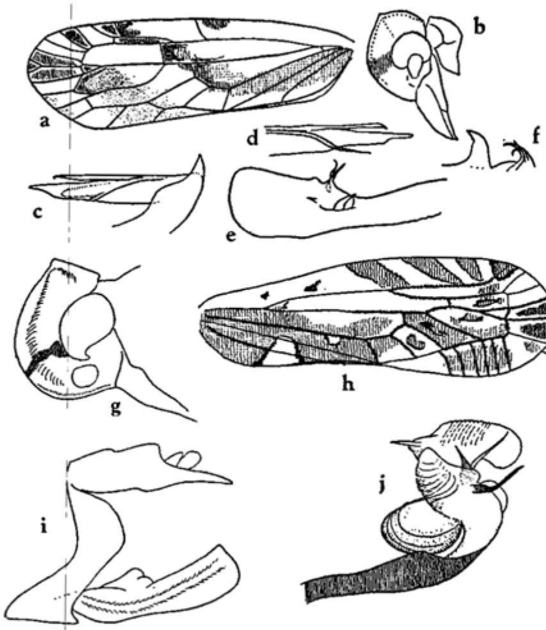


FIGURE 37.—a-f, *Kamendaka (Eosaccharissa) lar: a,* tegmen; *b,* head in profile; *c,* apical part of aedeagus, left side; *d,* apical part of aedeagus, right side; *e,* genital style; *f,* processes of genital style. g-j, *K. (E.) polyphemus: g,* head, side view; *h,* tegmen; *i,* anal segment, pygofer, and genital style, left side; *j,* aedeagus, left side.

moderately narrow at base, expanding distally, distal margin rounding from below, apex acute, a little curved mesad, an elongate triangular eminence on dorsal margin in basal two-fifths, minutely setose; just distad of this a sclerotized plate produced vertically in a short rounded lobe and dorsolaterally in a rather slender spine.

Male: length 3.5 mm., tegmen 4.8 mm.

Holotype, male (US 62169), Yap I., Yap Is., July-Aug. 1950, Goss. Yap: Six males, two females, and one mutilated specimen, July-Aug. 1950, Goss; on banana leaf, July 1946, Oakley; 60 m., Mt. Matade, Dec. 1952, Gressitt.

CAROLINE ATOLLS. ULITHI: Three males and one female, Mogmog, Oct. 1952, Krauss, Mangejang I., Aug. 1945, Davison. FAIS: Sixteen males, Oct. 1952, Krauss. WOLEAI: Six males and four females, Utegal, on *Alocasia,* July 1946, Townes and Sept. 1952, Krauss; Falalis, Feb. 1953, Beardsley; Oleai I., three males; Falulap I., Jan. 1938, Esaki, Oct. 1952, Krauss. SOROL: Four males and one female, Sorol I., Oct. 1952, Krauss. LAMOTREK: One male, Lamotrek I., Sept. 1952, Krauss.

DISTRIBUTION: Western Caroline Is. (Yap, Caroline atolls).

A single female from Truk (Pata, Sabote-Epin, Apr. 1940, Yasumatsu and Yoshimura) is provisionally assigned to this species. The general features, including tegminal venation, agree with those of typical *lar;* the posterior margin of the pregenital sternite is broadly, almost semicircularly, rounded. The tegmina are pallid, heavily mottled with gray, and the main veins are dark gray.

This species agrees generally with *E. philippina* Muir, but it differs in the tegminal markings and in the shape of the medioventral process of the pygofer and that of the genital styles. The aedeagus of *E. philippina* has not been described.

96. Kamendaka (Eosaccharissa) perplexa (Metcalf), new comb.

Ona perplexa Metcalf, 1954, Elisha Mitchell Sci. Soc., Jour. **70** (1): 12.

This species, at present known only from Ponape, was not represented in the collections examined. It differs from *K. lar* in the deeper curvature of the frons in profile, in the broader costal cell, minor details of tegminal venation, and in the aedeagal processes.

97. Kamendaka (Eosaccharissa) polyphemus Fennah, n. sp. (fig. 37, *g-j*).

Pallid, almost white; mesonotum and pro- and mesotibiae at apex yellowish orange; a stripe across genae before eyes, a stripe along profemora, metafemora, metatibiae and metatarsus basally, and outermost spine at apex of metatibiae, a mark on each side of abdomen ventrally near base, and genitalia lightly fuscous. Tegmina mostly dull yellow; a broad patch overlying anterior half of corium, three oblique bands near stigma, and an oblique suffusion across subapical cells as far as apex of clavus white; a faint fuscous line frequently separating white areas from yellow; veins red, but white in white areas.

Anal segment of male moderately long in dorsal view with lateral margins subparallel, shallowly concave near middle, apical margin deeply rounded. Pygofer with laterodorsal angles moderately produced, deeply convex, medioventral process rather long, turbinate. Genital styles in ventral view moderately broad, shallowly sinuate, widening distally, a stout spine-like process on inner margin at middle, directed mesad; a minute spine on mesal margin just distad of this; dorsal margin produced in basal half in a large broadly triangular setigerous lobe, bearing a slender spine, directed laterad, at its distal end. Aedeagus long, tubular, shallowly curved upward; flagellum tubular, sinuate, produced to right at apex in a moderately broad lobe.

Pregenital sternite of female strongly produced caudad in a deeply convex lobe.

Male: length 2.9 mm., tegmen 4.1 mm.; *female:* length 3.6 mm., tegmen 5.1 mm.

Holotype, male (US 62206), Mt. Tafeayat, Kusaie, Feb. 9, 1953; allotype, female, Wakap, Apr. 17, 1953, Clarke. Kusaie: One male and three females,

Mt. Tafeayat, 518 m., Feb. 9, 1953, Clarke; Mt. Matante, 280 m., Feb. 1953, Clarke; Wakap, 90 m., Apr. 1953, Clarke.

DISTRIBUTION: Eastern Caroline Is. (Kusaie).

This species is distinguished from other *Eosaccharissa* by the shape of the head in profile and by the color and shape of male genitalia, and is distinguished from *Nicertoides jokaji,* which it superficially resembles, in its bright tegminal markings and in the shape of the head.

98. **Kamendaka (Eosaccharissa)** sp.

DISTRIBUTION: Western Caroline Is.

PALAU. KOROR: Two females, Mar. 1954, Beardsley.

Genus **Swezeyia** Kirkaldy

Swezeyia Kirkaldy, 1906, Hawaiian Sugar Planters' Assoc. Exper. Sta., Ent. Bull. 1 (9): 430 (haplotype: *Swezeyia lyricen* Kirkaldy, op. cit.).

Post-tibiae apically four-spined; basal metatarsal segment five-spined, second metatarsal segment four-spined.

99. **Swezeyia zephyrus** Fennah, n. sp. (fig. 38, *a-g*).

Vertex of male with margins parallel between eyes, incurved distad of eyes and contiguous for a distance equal to two-thirds length of disc, then much thickened and divergent at apex; vertex of female broad throughout, lateral margins straight, slightly converging distad, narrow at base, evenly but considerably thickening distad, apical margin shallowly concave; head of both sexes in profile markedly produced anterodorsally to eyes, frons and margins of basal half of vertex parallel, vertex deeply, and semicircularly rounded into frons; antennae of male much surpassing eyes but not attaining level of apex of head; antennae of female not reaching to apical margin of eyes.

Stramineous; antennae, sides of head before eyes, pronotum behind eyes, mesonotum laterally, a broad straight band, diffuse at edges, from base to apex of each tegmen along its middle line yellowish brown, a small round spot on subapical cross vein in M piceous, veins pale yellow, orange brown in darker areas. Wings hyaline with veins orange.

Pygofer short, lateral margins sinuate. Anal segment rather long, with margins parallel, lower margin produced ventrocaudad at apex, anal foramen at apex. Aedeagus narrowly tubular, curved upward distally, deeply rounded at apex, apical portion forming a sheath above short membranous folded central limb of aedeagus. Genital styles narrow at base, expanding distally, ventral margin convex, dorsal margin straight, ascending to just distad of middle, then abruptly excavate with a minute sclerite at base of excavation, distad of this a thin subovate lobe; style traversed lengthwise by a curved ridge which projects slightly at apex.

Pregenital sternite of female with posterior margin produced caudad, the posterolateral margins shallowly concave, apex in ventral view medially notched, in posterior view abruptly and narrowly produced dorsad, and medially with a linear groove.

Male: length 2.8 mm., tegmen 3.7 mm.; *female:* length 3.0 mm., tegmen 4.0 mm.

Holotype, male (US 62174), Ponape, Colonia, June-Sept. 1950, Adams.

S. MARIANA IS. GUAM: Twelve males and 17 females, Comm. Mar. Hill, Jan. 1949, Owen; Mt. Lamlam, 400 m., Nov. 1952, Gressitt; Mt. Alifan, Aug. 1952, Krauss; Agana, Oct. 1952, Krauss; Potts Junction, Oct. 1952, Krauss; Barrigada, Nov. 1952, Gressitt; Yona, Oct. 1952, Krauss; Talofofo, Aug.

1952, Krauss; Mt. Balanos, Aug. 1952, Krauss; Pt. Oca-Tumon, Nov. 1952, Gressitt.

PALAU. KOROR: Two females, Dec. 1952, June 1953, Beardsley.

CAROLINE ATOLLS. ULITHI: Twelve females, Fassarai I., July 1946, Townes. WOLEAI: Ten males and 16 females, Utegal I., on breadfruit, July 1946, Oakley; Falalis I., Oct. 1952, Krauss; Ualiap I., Sept. 1952, Krauss;

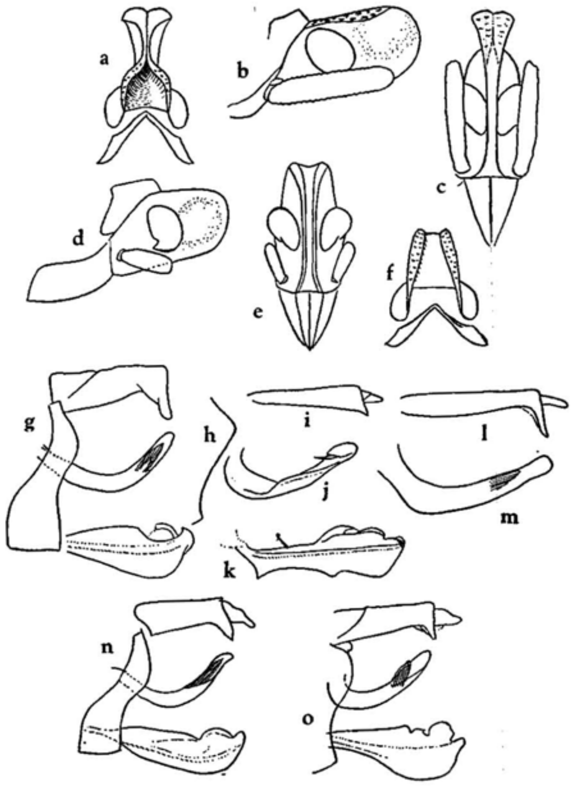


FIGURE 38.—**a-g,** *Swezeyia zephyrus: a,* vertex and pronotum, male; *b,* head in profile, male; *c,* frons and clypeus, male; *d,* head in profile, female; *e,* frons and clypeus, female; *f,* vertex and pronotum, female; *g,* male genitalia. **h-k,** *S. ganesa: h,* posterior margin of pygofer; *i,* anal segment of male; *j,* aedeagus; *k,* genital style. **l, m,** *S. typhon: l,* anal segment of male; *m,* aedeagus. **n,** *S. polyxo,* male genitalia. **o,** *S. metanira,* male genitalia.

Falulap, Jan. 1938, Aug. 1939, Esaki. FARAULEP: One male and two females, Faraulep I., Sept. 1952, Krauss, Feb. 1953, Beardsley. IFALUK: One male, Ifaluk I., Sept. 1952, Krauss. SATAWAL: One male and three females, Sept. 1952, Krauss; one mutilated specimen, tentatively placed here, Feb. 1953, Beardsley. LOSAP: Two males, Losap I., Oct. 1952, Beardsley. ETAL: One female, Etal I., Nov. 1952, Beardsley. MOKIL: One female, Jan. 1953, Gressitt.

PINGELAP: One male and two females, Jan. 1953, Gressitt. KAPINGAMARANGI: Six males and one female, Hare I., Aug. 1946, Townes.

TRUK. Seven males and 13 females. WENA: Nofo, Mt. Winifourer, Feb. 1949, Potts; north basin, Mt. Chukumong, Mar. 1949, Potts, 180 m., July 1946, Townes, Feb. 1948, Maehler, Oct. 1952, Beardsley. TON: Mt. Unibot, Dec. 1952, Gressitt. TONOAS: Toloas-Erin, Dec. 1937, Esaki.

PONAPE: Thirty-five males and 56 females, Agric. Exper. Sta., Colonia, June-Sept. 1950, Adams, Sept., Nov. 1953, Beardsley, Jan. 1953, Gressitt, Aug. 1946, Oakley, Jan. 1953, Clarke, Dec. 1937, Esaki; Mt. Temwetemwensekir, 180 m., Jan. 1953, Gressitt; Jokaj I., 2 m., Jan. 1953, Gressitt; Nanponmal, north, southeast, Jan. 1953, Gressitt, Jan. 1953, Clarke; Nampil-Sankakuyama, Jan. 1938, Esaki; Palang, 15 m., Jan. 1953, Gressitt.

KUSAIE. Five males and 16 females, Mt. Tafeayat, 150-240 m., Aug. 1946; Matanluk (Yepan), Jan. 1953, Gressitt, 22 m., Mar., Apr. 1953, Clarke; "Hill 1010," 300 m., Apr. 1953, Clarke; Lele I., 100 m., Feb. 1953, Clarke, Dec. 1937, Esaki; Innem River, 60 m., Jan. 1953, Clarke; Wakap, 490 m., Apr. 1953, Clarke; Mt. Matante, 380 m., Feb. 1953, Clarke; Malem River, 90 m., Mar. 1953, Clarke, Dec. 1937, Esaki.

MARSHALL IS. KWAJALEIN: One female, Bigej (Bennett I.), Aug. 1944, Wallace. UJAE: One male, Ujae I., Oct. 1953, Beardsley. NAMORIK: One male and one female, Namorik I., Sept. 1953, Beardsley. EBON: Two males and two females, Ebon I., Sept. 1953, Beardsley. NAMU: Three males, Namu I., Oct. 1953, Beardsley. JALUIT: One male and two females, Medyado I., Aug. 1946, Oakley. MAJURO, 10 males and four females: Dalap, on breadfruit, Aug. 1946, Oakley, Aug. 1946, Townes; Uliga, Nov. 1953, Beardsley. WOTJE: Two males and five females, Nov. 1937, Esaki, Oct. 1953, Beardsley. ARNO: Five males and nine females, Ine I., on *Wedelia,* May, June, Aug. 1950, La Rivers. MILI: One female, Alu, Oct. 1953, Beardsley.

GILBERT IS. ONOTOA: Two females, Buiartum I., June, July 1951, Moul.

DISTRIBUTION: Micronesia.

This species differs from *Swezeyia fuscofasciata* (Muir) in the shape of the basal half of the vertex in the male, the shape of the head in profile, and in the shape of the distal margins of the vertex and of the head in profile in the female. It differs in these characters and in coloration from other Philippine species. It differs from *S. maurellei* Muir in the shape of the head in profile.

100. **Swezeyia polyxo** Fennah, n. sp. (figs. 38, *n;* 39, *g-l*).

Vertex of male very long, spatulate, lateral margins at base much thickened, convex, meeting before eyes by half the length of an eye, disc very deeply hollowed out, vertex distally with margins straight, diverging distally, apical margin biconvex, medially notched, upper surface of distal portion of cephalic process hollowed out; cephalic process in profile narrow, porrect anteriorly. Vertex of female fully three times as long as an eye, rather broad at base, distally slightly widening, lateral margins thickened, apical margin incised; head in profile with base of vertex and distal part of frons parallel, basal part of frons

oblique, shallowly convex; frons of female dorsally broad, narrowing ventrally; antennae of male simple, much surpassing eyes, those of female just attaining upper margin of eye.

Creamy white, powdered white; mesonotum sometimes brownish. Tegmina colored and marked as in *S. zephyrus,* but the palest veins creamy white or subhyaline.

Pygofer moderately long, lateral margins sinuate, widely convex in dorsal half, medioventral process absent. Anal segment moderately long, porrect, in profile slightly constricted before apex, with lower distal margin slightly produced ventrad, anal foramen at

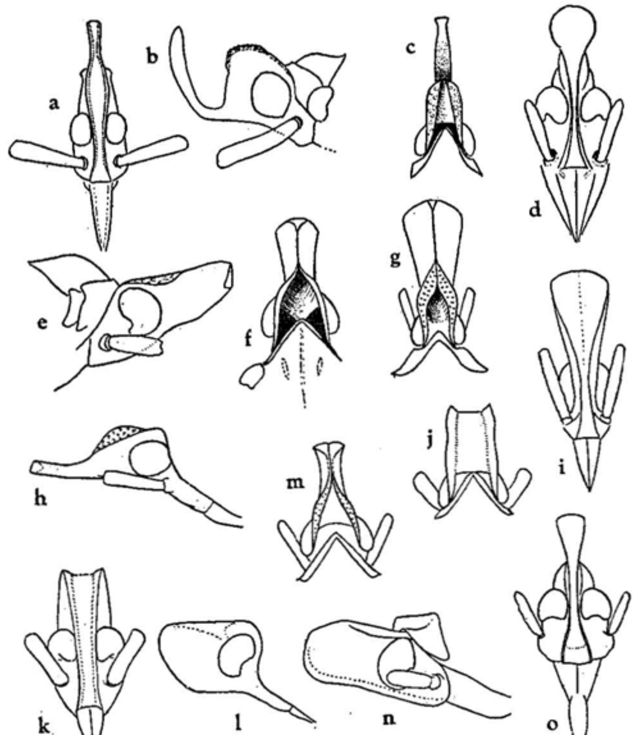


FIGURE 39.—**a-c,** *Swezeyia ganesa* (male): *a,* frons and clypeus; *b,* head in profile; *c,* vertex and pronotum. **d-f,** *S. metanira* (male): *d,* frons and clypeus; *e,* head in profile; *f,* vertex and pronotum. **g-l,** *S. polyxo: g,* vertex and pronotum, male; *h,* head in profile, male; *i,* frons and clypeus, male; *j,* vertex and pronotum, female; *k,* frons and clypeus, female; *l,* head in profile, female. **m-o,** *S. typhon* (male): *m,* vertex and pronotum; *n,* head in profile; *o,* frons and clypeus.

apex. Aedeagus narrowly tubular, curved upward distally, devoid of processes, apical margin deeply rounded, distal part of aedeagus forming a sheath for membranous inner portion, as in *S. zephyrus.* Genital styles narrow at base, expanding distally, dorsal margin straight, bearing a small sclerotized papilla one-third from apex; just distad of this papilla margin strongly convex, then deeply excavate before incurved apex.

Pregenital sternite of female subtriangularly produced caudad, medial portion in ventral view transverse, not emarginate.

Male: length 3.0 mm., tegmen 4.0 mm.; *female:* length 2.8 mm., tegmen 4.0 mm.

Holotype, male (US 62175), Yap, July-Aug. 1950, Goss.

PALAU. KOROR: One male, Sept. 1952, Krauss.

YAP. YAP: Fifteen males and 24 females, July, Aug. 1950, Goss, on breadfruit, Oct. 1952, Krauss; hill behind Yaptown, 50 m., Dec. 1952, Gressitt; Dugor, July-Sept. 1950, Goss; Dugor-Rumu, 10 m., Nov. 1952, Gressitt; central Yap, Aug. 1950, Goss; Colonia, on *Mangifera,* Aug. 1950, Goss.

CAROLINE ATOLLS. SONSOROL: One male, Sept. 1952, Krauss. ULITHI: Fifteen males and three females, Fassarai I., Aug. 1946, Townes and Oct. 1952, Krauss; Potangeras I., Nov. 1947, Dybas. FAIS: One female, Oct. 1952, Krauss.

TRUK. TON: Mt. Unibot, Sept. 1952, Gressitt. FEFAN: Mt. Iron, Jan. 1953, Gressitt. WENA: Mt. Chukumong, Mar. 1949, Potts. Three males.

DISTRIBUTION: Caroline Is.

This species is distinguished by the shape of the head of the male and female, by coloration, and by the shape of the male and female genitalia. The male genitalia are like those of *S. zephyrus,* but the aedeagus is more slender and the dorsal margin of the genital styles is different. The pregenital sternite of the female differs from that of *S. zephyrus* in the shape of the posterior margin.

101. Swezeyia metanira Fennah, n. sp. (figs. 38, *o;* 39, *d-f*).

Vertex of male in dorsal view as in *S. zephyrus,* but with lateral margins between eyes slightly converging, not parallel, and apex of vertex not so dilated, head in profile relatively narrow, frons and vertex converging distally, not parallel; frons in facial view broadest near base, narrowing distally until lateral margins are contiguous (between eyes) then moderately widening to suture; antennae of male not reaching to upper margin of eyes.

Fuscous; lateral margins of vertex at base, and of frons at base, posterior margin of pronotal disc narrowly, a spot on hind margin near tegulae, tegulae, clypeus, rostrum and legs, pallid stramineous; lateral mesonotal carinae near middle and margin of mesoscutellum yellow, mesonotum otherwise castaneous. Tegmina dark smoky brown, pruinose with a thin layer of grayish wax, a small spot on cross veins in M slightly darker; extreme base of tegmina pallid stramineous; veins and margins red, except posterior margin distad of claval apex, which is orange yellow. Wings smoky, powdered gray, veins red.

Pygofer short, longer ventrally, lateral margins sinuate, broadly and shallowly convex dorsad of middle, medioventral process absent. Anal segment tubular, slightly narrower distally, ventrally slightly hollowed out lengthwise, lower margin shortly produced obliquely ventrad at apex. Aedeagus tubular, shallowly U-shaped, apex deeply rounded, apical portion forming a sheath for membranous inner portion which is slenderly trispinose at apex. Genital styles narrow at base, expanding in basal fifth, then of more or less equal width distad, a small curved tooth on exterior face two-thirds from base, dorsal margin shallowly convexly lobate just distad of this, the dorsal margin not excavate between tooth and lobe, apex bluntly pointed and incurved.

Male: length 2.6 mm., tegmen 3.8 mm.

Holotype, male (US 62172), Ulimang, Babelthuap, Palau Is., Dec. 16, 1947, Dybas. Babelthuap: Four males and one female, Ulimang, Dec. 16, 1947, Dybas; east Ngatpang, 65 m., Dec. 1952, Gressitt. Koror: One male and two females, July 1953, Beardsley; islet near Koror, Sept. 1952, Krauss.

DISTRIBUTION: Western Caroline Is. (Palau).

This species is distinguished by the shape of the head, by the coloration, and by the shape of the male genitalia, in which that of the dorsal margin of the genital styles is perhaps the most distinctive feature. In the aedeagus the terminal orifice of the outer tube is on the left side of the apex.

102. Swezeyia typhon Fennah, n. sp. (figs. 38, *l, m;* 39, *m-o*).

Vertex of male in dorsal view as in *S. metanira,* head in profile extended anterodorsad of eyes, basal portion of frons parallel to basal portion of vertex, apical margin semicircularly rounded, frons in facial view as in *S. metanira;* antennae of male just attaining upper margin of eyes.

Pallid testaceous, powdered white; a slight mark on frontal margins before eyes, a band on pronotum behind eyes, and upper portion of mesopleura castaneous fuscous. Tegmina marked as in *S. zephyrus* but infuscation faint.

Genitalia very similar to those of *S. zephyrus,* but aedeagus in side view bluntly rounded, not tapering and deeply rounded: genital styles with lobe on dorsal margin distad of lateral spine symmetrically and shallowly convex. Anal segment at apex with lower margin shortly and abruptly produced ventrad.

Male: length 2.8 mm., tegmen 3.4 mm.

Holotype, male (US 62173), Koror, Palau Is., Nov. 19, 1947, Dybas.

DISTRIBUTION: Western Caroline Is. (Palau).

This species is distinguished from *S. zephyrus,* which it resembles in profile of head, by the shape of the vertex in dorsal view and that of the frons in facial view; the surface contours of the sides of the head differ in the two species as a result of the greater dilation of the apex of the head in *S. zephyrus. S. typhon* also differs in the shorter antennae. In the male genitalia the apex of the aedeagus is differently shaped, as is the dorsal margin of the genital styles. The anal segment also differs between these species, that of *S. typhon* having a lateral margin which in profile is subrectangulately bent ventrad near apex, while that of *S. zephyrus* is decurved through 45 degrees or less to apex. *S. typhon* is distinguished from *S. metanira,* which it resembles in some respects, by the profile of the head, by the coloration, and especially by the shape of the genital styles.

103. Swezeyia ganesa Fennah, n. sp. (figs. 38, *h-k;* 39, *a-c*).

Vertex of male long, narrow in dorsal view, slightly tapering distally, with lateral margins thickened, for a distance before eye equal to length of eye, then abruptly narrowed in a slender cephalic process: in profile, basal part ascending, cephalic process long and deeply U-shaped; antennae about 2.5 times length of an eye.

Pallid, margins of frons in male near apex of cephalic process, and sides of process near its base slightly fuscous; mesonotum brown. Tegmina hyaline, a faint band from base to apex of clavus and extending inward to M, membrane distad of nodal line except in apical cells of Cu_1 brown or pale fuscous, nodal line and subapical line of cross veins unpigmented; veins concolorous. Wings hyaline, powdered white.

Anal segment of male long, tubular, flat below, porrect caudad, anal foramen at apex. Pygofer fairly short, dorsolateral angles obtusely angulate, medioventral process absent. Aedeagus long, tubular, slightly inflated at apex with a short spine directed cephalad. Genital styles narrow at base expanding distally, a triangular, distally acute, process on upper margin just distad of level of preceding process, a convex eminence, distally exca-

vate and toothed on dorsal margin just distad of middle, and a further convex eminence just distad of this, apical margin rounded and incurved.

Male: length 2.3 mm., tegmen 3.6 mm.

Holotype, male (US 62176), Nama I., Caroline Is., Dec. 18, 1950, Langford.

PALAU. BABELTHUAP: One male and one female, east Ngatpang, 65 m., 1952, Gressitt; Ngarumisukan-Kaishar, Aug. 1939, Esaki.

YAP. YAP: One female, Mt. Matade, 95 m., Dec. 1952, Gressitt.

CAROLINE ATOLLS. NAMA: Four males and one female, Dec. 18, 1950, Langford.

TRUK. Fourteen males and 15 females. TON: Netutu, Apr. 1949, Potts; Mt. Unibot, Dec. 1952, Gressitt. PATA, Sabote, Apr. 1940, Yasumatsu and Yoshimura. WENA: 180 m., July 1946, Oct. 1952, Beardsley; Mt. Teroken, north part, Dec. 1952, Gressitt, Feb. 1948, Dybas; Mt. Chukumong, north basin, Mar. 1949, Potts. TONOAS: 300-600 m., May 1946, Townes. FEFAN: Mt. Iron, Jan. 1953, Gressitt.

GILBERT IS. ONOTOA: One male, Buiartum I., June 1951, Moul.

DISTRIBUTION: Caroline Is., Gilbert Is.

This species is similar to *Swezeyia lyricen* Kirkaldy but differs in the much longer cephalic process. It is separated from the other Micronesian species by this character and by the different aedeagal structure.

Genus **Kampulokara** Muir

Kampulokara Muir, 1913, Hawaiian Sugar Planters' Assoc. Exper. Sta., Ent. Bull. 12 (1): 45 (orthotype: *Kampulokara caenosum* Muir, op. cit.).

This generic concept was based on female material from Larat. It is characterized by an extremely close resemblance to *Swezeyia,* from which it differs in the shape of the vertex of the female, which in *Kampulokara* curves upward slightly at the apex.

104. **Kampulokara** sp. (fig. 40, *a-d*).

There are two female specimens in the collection which must be referred to this genus. The first of these is from Tol, Truk (Netutu, Apr. 9, 1949, Potts) and, apart from differences in the shape of the head, agrees in all non-genitalic characters perfectly with *Swezeyia ganesa* from Nama, some 100 kilometers away.

105. **Kampulokara** sp. (fig. 40, *e-h*).

Vertex of female at base in dorsal view about three times as wide as at apex, lateral margins moderately thick throughout: in profile margin sinuate, convex above eyes and curved upward again at apex: frons in facial view rather broader at base than at middle, carinae parallel between eyes, not contiguous.

Pallid, in life probably powdered white; base of frons and sides of head before eyes fuscous. Tegmina hyaline, powdered grayish white, faintly suffused with sordid yellow

from base of clavus to apex of Cu, and even more faintly distad of nodal line. Veins white, concolorous in Cu, narrowly overlain with fuscous brown as follows: a short stripe in R near R-M cross vein and a minute fleck between this and subapical cross veins, M for a short distance basad of second fork and along middle portion of each branch of M between this fork and subapical cross veins.

Female: length (apex of vertex to tip of mesoscutellum) 2.0 mm., tegmen 4.8 mm.

One mutilated female was collected (Babelthuap, Palau Is., Ngiwal, Oct. 14, 1951, Gressitt). The material consists merely of the head and thorax and one tegmen. The sex is shown by the shape of the head.

This specimen differs from the preceding female (from Tol) in size, shape of the head, and tegminal coloration. The extent of the differences can be judged most readily from the figures. It also differs from *K. caenosum* Muir in

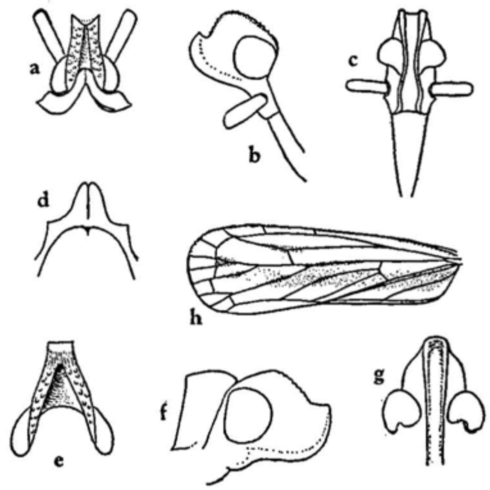


FIGURE 40.—*Kampulokara* spp.: **a**, vertex and pronotum, female; **b**, head in profile, female; **c**, frons and clypeus, female; **d**, posterior margin of pregenital sternite, ventral view, female; **e**, vertex; **f**, head in profile; **g**, basal half of frons; **h**, tegmen.

the more distinctly elevated apex of the vertex, in the margins of the frons being distinctly closer together between the eyes than at the base, and, in the tegmen, in the separate first sector of M and Cu_{1a}, veins which in *K. caenosum* form a short common stalk. The coloring appears to be very similar to that of *K. caenosum,* but in the present specimen the lateral areas of the pronotum and mesonotum are not at all infuscate, as they are in *K. caenosum,* whereas the cubital veins are not at all "tinged with black," as is the case in *K. caenosum.*

This species appears to be rare in its native habitat, or perhaps of only seasonal abundance. As it represents a new generic element in the fauna of the Palau Islands, it has been described to facilitate recognition. I prefer not to name this species formally, as the existing material is too fragmentary to serve as a satisfactory type specimen.

Genus **Eusyphax** Fennah, new genus

Head of same shape in both sexes. Vertex basally rather broad, moderately produced before eyes, distally rounding into frons; lateral margins thickened, but narrowed at base, slightly converging distally but not meeting. Frons rather narrow, with disc hollowed out, lateral margins straight, not contiguous (in these delicate forms the shape of the frons may be distorted on drying, and the carinae, through collapse of the frons, may be contiguous at the level of the antennae), slightly diverging distad, apical margin slightly longer than basal margin. Antennae with basal segment very short, second segment moderately broad, parallel-sided, not surpassing upper margin of eye in female and only little surpassing it in male, third joint terminal. No subantennal process present. Pronotum short, carinate medially and at lateral margins, lateroventral lobes directed ventrad, no antennal foveae present. Post-tibiae laterally unarmed, four teeth at apex (one large and separate from the others), basal metatarsal segment five-toothed, second metatarsal four-toothed. Tegmina relatively long, expanding distally, M separating from Sc+R at base, Sc+R fork at level of union of claval veins, first fork of M at middle of tegmen, M with four main sectors basad of subapical line of cross veins, clavus only narrowly open. R three-branched at apical margin, M six-branched, and Cu_1 three-branched. Wings three-quarters as long as tegmina.

Pygofer short, lateral margins shallowly convex, medioventral process absent. Anal segment long, narrow, strongly decurved distally, anal foramen on decurved portion. Aedeagus long, tubular, markedly curved dorsad, distal two-thirds occupied internally by striated or folded membrane: a small convex median lobe ventrally. Genital styles very long, upcurved distally and tapering to abruptly curved apex, dorsal margin with a short curved spine at middle and a small triangular lobe just distad of it. Pregenital sternite of female produced caudad with a pair of triangular lobes near middle projecting ventrad.

Type: *Pyrrhoneura bivittata* Metcalf.

This genus runs in the partially revised version of Muir's key (Fennah, 1952, Ent. Soc. London, Trans. **103**: 152) to *Swezeyia,* to which it is indeed very closely related phylogenetically. However, the shape of the head, the feeble sexual dimorphism (reflected only in the slightly longer antennae of the male), and the general structure of the male and female genitalia place it outside *Swezeyia.* It is also apparently close to *Tempora* Matsumura but differs in the tegminal venation and in the shape of the head. As the clavus is practically closed it might be regarded by some students as cenchreine, when it would run to *Phenice* or possibly to *Dawnaria,* from both of which it differs profoundly.

106. **Eusyphax bivittatus** (Metcalf), new comb.

Pyrrhoneura bivittata Metcalf, 1946, B. P. Bishop Mus., Bull. **189**: 113.

DISTRIBUTION: Southern Mariana Is. (Guam).

107. **Eusyphax bivittatus ianthe** Fennah, n. subsp. (fig. 41, *a-e*).

Vertex produced before eyes for length of an eye, rounding not quite smoothly into frons, though nearly so, apex of frons scarcely, if at all, wider than base. Antennae subcylindrical, devoid of processes, apically rounded-truncate.

Pallid, in life powdered white; a band across frons and sides of head before eyes, pronotum behind eyes, and mesonotum laterally fuscous; abdomen grayish testaceous, sometimes with a narrow red seam laterally. Tegmina suffused fuscous; area between

costa and R and sutural margin broadly, except for an interruption at claval apex, and a round spot in middle of tegmina hyaline.

Pygofer short, lateral margins very shallowly convex, widest at middle, medioventral process absent. Anal segment in dorsal view with sides parallel in basal two-thirds, then slightly incurved to the truncate-convex apparent apex: in profile, constricted distad of middle and decurved through about 100 degrees, decurved portion almost flat, weakly angulately excavate on apical margin. Aedeagus long, simple, tubular, curved dorsad distally, tapering in apical quarter to pointed apex.

Pregenital sternite of female with distal margin produced in two short triangular lobes which weakly project ventrad.

Male: length 2.1 mm., tegmen 3.4 mm.; *female:* length 2.0 mm., tegmen 3.3 mm.

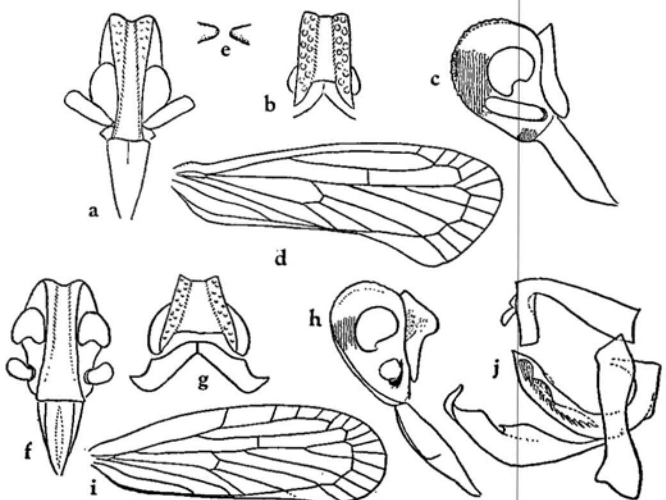


FIGURE 41.—**a-e**, *Eusyphax bivittatus ianthe: a,* frons and clypeus; *b,* vertex; *c,* head in profile; *d,* tegmen; *e,* processes adjoining apical margin of pregenital sternite. **f-j**, *E. b. lineatus: f,* frons and clypeus; *g,* vertex and pronotum; *h,* head and pronotum in profile; *i,* tegmen; *j,* male genitalia.

Holotype, male (US 62171), Kolonia, Yap, on coconut, July, Aug. 23, 1950, Goss. Two males, three females, and one mutilated specimen, same data as for type.

DISTRIBUTION: Western Caroline Is. (Yap).

108. **Eusyphax bivittatus lineatus** Fennah, n. subsp. (fig. 41, *f-j*).

Head as broad at base as long, lateral margins strongly convergent distally, eyes, pronotum behind eyes, and mesonotum laterally brownish fuscous. Tegmina hyaline powdered grayish white; a broad band, diffuse at its edges, straight from base to apex in M light fuscous. Wings hyaline, powdered white, veins white or faintly brown.

Pregenital sternite of female produced on each side of middle line into a large triangular process directed ventrocaudad.

Holotype, female (US 62170), Angaur, Palau Is., Feb. 4, 1948, Dybas.

S. MARIANA IS. SAIPAN: One female, As Mahetog area, Apr. 1945,

Dybas. GUAM: Two males and two females, Pt. Ritidian, May 1945, Gressitt, Mt. Lamlam, Oct. 1952, Krauss; Fadang, May 1945, Dybas.

PALAU. BABELTHUAP: Six males and three females, 65 m., east Ngatpang, Dec. 1952, Gressitt. KOROR: Three females, Aug. 1939, Esaki, Apr. 1953, Beardsley, Nov. 1947, Dybas. PELELIU: Six females, east coast, Aug. 1945, north central, Aug. 1945, Dybas. ANGAUR: One male and three females, Aug. 11-12, 1945, Feb. 4, 1948, Dybas.

DISTRIBUTION: Western Caroline Is. (Palau), southern Mariana Is.

The subspecies is distinguished from *E. bivittatus ianthe* by the differently shaped vertex, by the tegminal coloration, and by the size of the triangular processes on the pregenital sternite of the female.

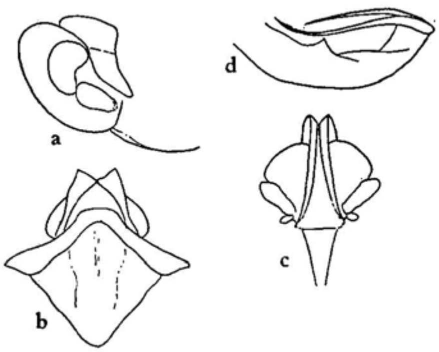


FIGURE 42.—*Pyrrhoneura saccharicida:* **a**, head and pronotum in profile; **b**, head and thorax, dorsal view; **c**, frons and clypeus; **d**, aedeagus, left side.

Genus **Nesokaha** Muir

Nesokaha Muir, 1913, Hawaiian Sugar Planters' Assoc. Exper. Sta., Ent. Bull. 12 (1): 51 (orthotype: *Nesokaha piroensis* Muir, loc. cit.).

109. **Nesokaha infuscata palauana** Fennah, n. subsp.

Differs from typical subspecies in details of coloration.

Female: Pallid stramineous; margins of frons at junction with vertex, a small mark on pronotum behind each eye, lateral angles of mesonotum and mesoscutellum dark fuscous; sides of head above eyes, pronotal disc, mesonotum laterad of disc scarlet. Tegmina hyaline, slightly milky, a straight vitta from base of clavus to apical margin in M, produced backward to reach claval margin in apical third of clavus, dark fuscous; portion of clavus that is not infuscate, an elongate spot near margin just distad of claval apex and veins Sc, R, and M in pale area, bright yellow; veins in infuscate areas scarlet.

Pregenital sternite of female posteriorly angulately produced caudad, median area raised from base to apex and traversed along middle line by a narrow deep incision. Length 3.7 mm., tegmen 6.2 mm.

Holotype, female (US 62164), Ngarmalk, Dec. 13, 1952, Gressitt. One female Babelthuap, Aimeliik, Apr. 1954, Beardsley; one female, Koror, Jan.

1954, Beardsley; two females, Peleliu, Mt. Amiangal, Dec. 23, 1952, Gressitt; one female, Ngarmalk (NW. Auluptagel), 25 m., Dec. 13, 1952, Gressitt.

DISTRIBUTION: Western Caroline Is. (Palau).

This subspecies differs from the typical subspecies [Muir, 1914, Hawaiian Ent. Soc., Proc. **3** (1): 47] in the pallid yellow tegulae, abdomen, and genitalia (as contrasted with dark brown); in the completely pallid costal, subcostal, and first medial areas from base to apex (as contrasted with brown basal half of subcostal cell).

Tribe CENCHREINI

Key to Australasian Genera of Cenchreini

1. Subantennal process absent or very small 2
   Subantennal process well developed 7

2 (1). Pronotum with lateral carinae absent or feebly developed 3
   Pronotum with lateral carinae well developed 5

3 (2). Frons and vertex in profile meeting at an angle 4
   Frons and vertex in profile forming a curve .... **Dawnaria** Distant

4 (3). Subcostal cell long .... **Goneokara** Muir
   Subcostal cell short .... **Vekunta** Distant

5 (2). Length of vertex subequal to width at base 6
   Length of vertex much exceeding width at base, vertex narrow .... **Basileocephalus** Kirkaldy

6 (5). Basal metatarsal segment with seven spines in an even row; tegmina with M four-branched; claval apex at or very near to middle of tegmen .... **Nesorhamma***
   Basal metatarsal segment with seven very irregular spines. Tegmina with M five-branched; claval apex distad of middle .... **Phaciocephalus** Kirkaldy

7 (1). Pronotum with lateral carinae absent or feebly developed 8
   Pronotum with lateral carinae strongly developed .... **Neocyclokara** Muir

8 (7). Tegmina with subcostal cell long .... **Eocenchrea** Muir
   Tegmina with subcostal cell short 9

9 (8). Frons and vertex in profile meeting at an angle, subantennal process forming a carina below antenna .... **Lamenia** Stål
   Frons and vertex in profile forming a curve, subantennal process semicircular; antennae ovate, not reaching to apex of head .... **Cyclometopum** Muir

Genus **Nesorhamma** Fennah, new genus

Vertex a little broader across basal margin than long along sides, distally rounding into frons; lateral margins strongly convex in profile, moderately broad, converging distad but not meeting; anterior margin narrow but distinctly carinate, posterior margin broadly concave. Frons about 2.8 times as long as broad, narrowest between eyes, lateral margins elevated but not much thickened, shallowly concave to below level of antennae then weakly convex to frontoclypeal suture, disc of frons deeply sunken; clypeus about as long as frons, tricarinate; lateral ocelli present, antennae with basal segment broader than long, second segment ovate; rostrum much surpassing post-trochanters. Pronotum relatively short, anteriorly fitting close against head, median carina strongly developed, lateral carinae of discal area feebly indicated near posterior margin, absent elsewhere, lateral marginal carinae strongly elevated, lower pronotal margins produced anteriorly to form a fovea

with preceding, hind margin of pronotum obtusely angulate at middle; mesonotum much broader than long, distinctly tricarinate, with lateral carinae sinuate, converging posteriorly; post-tibiae laterally unarmed, six- to seven-toothed on apical margin, basal metatarsal segment seven- to eight-toothed, second metatarsal seven- to eight-toothed. Tegmina about 3.1 times as long as broad, of subequal width throughout, apical margin almost semicircularly rounded, Sc+R forked one-quarter from base, first M fork about level with claval apex, Cu_1 fork slightly basad of level of union of claval veins, R with two veins reaching apical margin, M with four and Cu_1 with two, six subapical cells present, apical cells extremely short; claval veins united at level of basal third of tegmina. Wings with R and M simple to apex, Cu_1 three-branched.

Anal segment of male moderately long, with lateral margins deep and apical margin short and excavate. Pygofer short dorsally, moderately long ventrally, medioventral process triangular.

Anal segment of female produced caudad in a broad subquadrate lobe.

Type: *Nesorhamma chalcas,* new species.

This genus resembles, and in standard keys runs down to, *Phaciocephalus* Kirkaldy. It differs from *Phaciocephalus* in the greater bodily size, in the form of the pronotal disc, in the number of teeth on the metatarsi, and in the tegminal venation.

110. Nesorhamma chalcas chalcas Fennah, n. sp. (figs. 43, *a-d;* 48, *a-c*).

Stramineous; mesonotum and posterior half of pronotum yellow; vertex and basal half of frons sordid orange; frons distally in middle line and clypeus in middle line throughout and pronotal foveae finely in middle of posterior margin dark fuscous. Tegmina subhyaline, powdered pale fawn, a narrow stripe along Sc+R continuing along Sc for almost half its length, a band from base of tegmen to R at apex, and another from base of clavus to tegminal apex, both broadly interrupted by the venation, and posterior margin distad of claval apex fuscous. Wings hyaline, powdered white; veins concolorous except one anal vein which is dark fuscous.

Pygofer short, longer ventrally, lateral margins shallowly convex, medioventral process prominent, elongate-triangular. Anal segment moderately long, anal foramen near

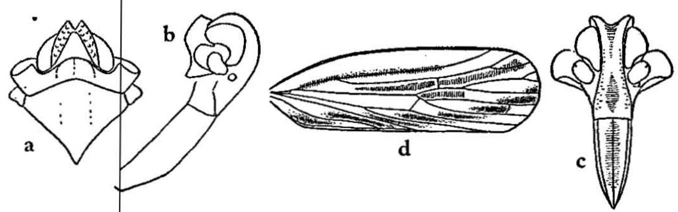


FIGURE 43.—*Nesorhamma chalcas chalcas:* **a**, head and thorax; **b**, head and pronotum in profile; **c**, frons and clypeus and antennal foveae of pronotum; **d**, tegmen.

middle, dorsal margin in profile shallowly subangulately sinuate, ventral margin strongly convex, sides deepest near middle, distal angles subrectangulate, apical margin deeply excavate. Aedeagus long, narrow, and slightly curved; a pair of moderately long slender spines arising at apex dorsally, one on each side, directed cephalad for one-third length of aedeagus; mesad of these spines, also in a dorsal position, a pair of elongated membranous processes directed cephalad, each of which is narrowly sclerotized on its upper and lower margin: the upper sclerotic margin distally projects free as a short oblique spine; the lower margin, which is longer than the upper, curves shallowly upward distally and tapers to a point medially; below flagellum at its base a submembranous fingerlike lobe with a hooklike process projecting ventrad. Genital styles moderately short and broad, ventral

margin slightly concave, distally produced mesad in a stout flattened falcate lobe, dorsal margin almost straight, a curved toothlike process directed laterocaudad three-quarters from base, a small triangular eminence on margin just distad of this, apical margin oblique, produced mesad in a broad plate which is shortly spined at its tip, a stout ridge traversing whole length of genital style, reaching to apical angle which is strongly and narrowly produced as a fingerlike lobe.

Male: length 3.9 mm., tegmen 5.8 mm.

Holotype, male (US 62205), northeast coast, Peleliu, Jan. 24, 1948, Dybas; paratype, male with same data (US). Peleliu, 19 males and four mutilated specimens, northeast coast, Jan. 24, 1948, on *Pandanus*, Dybas. Ngurukdabel (Urukthapel), one female, Ngeremediu, Dec. 1952, Gressitt. Babelthuap, three females, north Ngatpang, 65 m., Dec. 1952, Gressitt. Ngarmalk (NW. Aulup-tagel), two females, Sept. 1952, Krauss.

DISTRIBUTION: Western Caroline Is. (Palau).

This species is distinguished by the coloration and by the shape of the male genitalia.

111. Nesorhamma chalcas atrior Fennah, n. subsp.

Disc of frons entirely and clypeus in middle line, a stripe along mesonotum laterally in line with eyes, pro- and mesocoxae, mesopleura, and tarsi at apex fuscous. Color and markings otherwise as in typical subspecies. Aedeagus with dorsal free sclerotized margins of flagellum about one-fifth as long as attached portion.

Holotype, male (US 62144), Koror, Nov. 19, 1947, Dybas. Palau: Koror, one male and three females, Nov. 19, 1947, Dybas; Limestone Ridge south of inlet, Jan. 1948, Dybas, Dec. 1952, Gressitt. Angaur, Seven males and 31 females, Aug. 1945, Dybas.

DISTRIBUTION: Western Caroline Is. (Palau).

This subspecies differs from the typical subspecies in the more infuscate frons and the infuscate coxae and in the mesopleura and mesonotal vittae. In the genitalia the "spines" extending from the dorsolateral margins of the flagellum are relatively shorter than in the Peleliu population.

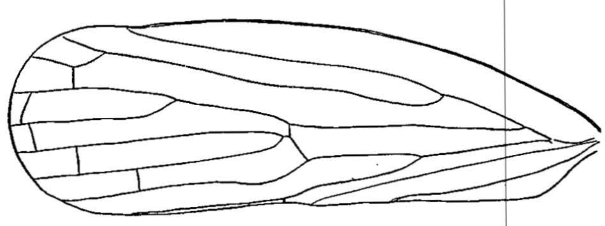


FIGURE 44.—*Nesorhamma badia*, tegmen.

112. Nesorhamma badia (Muir), new comb. (fig. 44).

Phaciocephala (*sic*) *badia* Muir, 1917, Philippine Jour. Sci. **12**: 58.

DISTRIBUTION: Philippines, Mariana Is.

S. MARIANA IS. GUAM: Two females, Tumon, Nov. 1952, Gressitt.

These specimens have been compared with topotypic (Philippine Island) material in the Baker Collection at the United States National Museum, and have proved to be conspecific.

Phaciocephalus flavocollaris Muir [1913, Hawaiian Sugar Planters' Assoc. Exper. Sta., Ent. Bull. **12** (1) : 34] appears to belong to this genus.

Genus **Lamenia** Stål

Lamenia Stål, 1859, Freg. Eugenies Resa, Zool. **4**: 277 (haplotype: *Delphax caliginea* Stål, 1854, Öfv. K. Vet.-Akad., Förh. **11**: 246).

113. Lamenia caliginea charon Fennah, n. subsp. (figs. 45, *a, g*; 46, *a, f, g*).

Castaneous piceous; profemora and basal joint of protarsi, mesofemora, mesotibiae except in distal third, and mesotarsi except apically, post-tibiae and post-tarsi (both except at apex) pallid stramineous; antennae brownish yellow; postfemora lightly infumed gray-

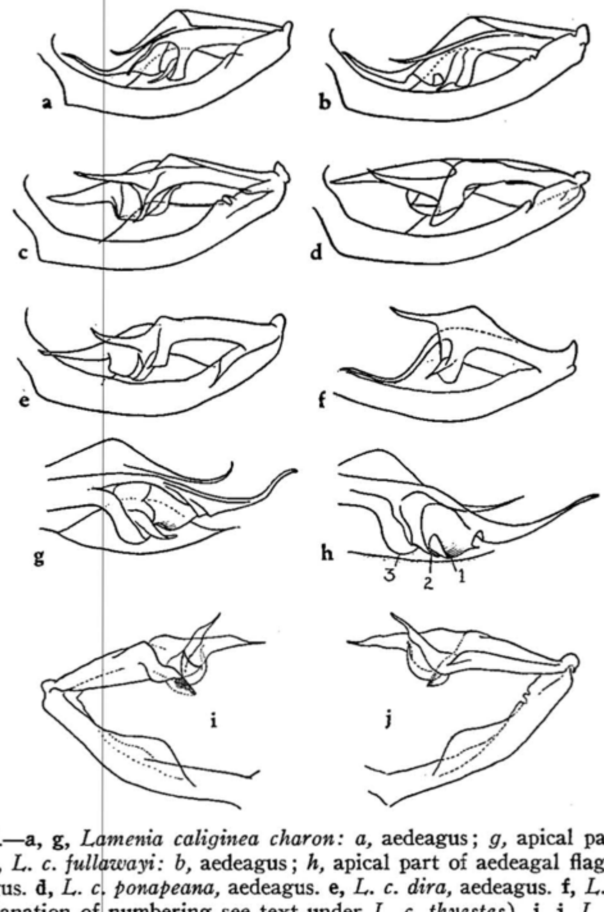


FIGURE 45.—**a, g,** *Lamenia caliginea charon: a,* aedeagus; *g,* apical part of aedeagal flagellum. **b, h,** *L. c. fullawayi: b,* aedeagus; *h,* apical part of aedeagal flagellum. **c,** *L. c. yapana,* aedeagus. **d,** *L. c. ponapeana,* aedeagus. **e,** *L. c. dira,* aedeagus. **f,** *L. c. sory,* aedeagus (for explanation of numbering see text under *L. c. thyestes*). **i, j,** *L. c. thyestes: i,* aedeagus, right side; *j,* aedeagus, left side.

ish fuscous; metapleura stramineous and orange. Tegmina translucent, fuscous piceous; costal margin very narrowly tawny; a round spot at stigma slightly prolonged distad on costal margin pale yellow; veins concolorous, apical margin red. Wings dark, veins concolorous, margin red.

Pygofer short dorsally, moderately long ventrally, lateral margins convex in dorsal half, straight in ventral half, medioventral process absent. Anal segment rather long, narrow, tapering to acutely pointed apex; in profile sinuate, narrow except at middle, where it is produced rather abruptly ventrad in a deep parabolic lobe. Aedeagus tubular, slightly curved, a large lenticular flange occupying middle portion of left dorsal margin, flagellum narrow and tubular at base, broadened toward apex and produced into two complex scroll-like processes, of which the shorter is directed ventrad and the longer cephalad (the latter terminates in a slender sinuate spine); on left side of flagellum, and appearing as a separate process, a long membranous appendage attached to flagellum along its inner edge by a pellucid membrane, distally forming a slender spine directed anteriorly and to right, and slightly upcurved at its tip. Genital styles long, parallel-sided, tapering and strongly incurved distally.

Male: length 2.5 mm., tegmen 3.5 mm.

Holotype, male (US 62149), Ine I., Arno Atoll, Marshall Is., Aug. 5, 1950, La Rivers.

MARSHALL IS. UJELANG: One male and two females, Ujelang I., Oct. 1953, Beardsley. ENIWETOK: One male, Japtan I., Mar. 1946, Townes. Kwajalein: One male and four females, Ennylabegan, Aug. 1944, Bryan; Bweje I., June 1945; Bennett I., Aug. 1944, Wallace; Ebeye I., Oct. 1953, Beardsley. LAE: One female, Oct. 1953, Beardsley. NAMU: Two males and two females, Kaginen I., Oct. 1953, Beardsley. NAMORIK: Two males and one female, Namorik I., Sept. 1953, Beardsley. AILINGLAPALAP: Four males and three females north Airek, Aug. 1946, Oakley; Bigatyelang, Aug. 1946, Townes; Wotje I., Oct. 1953, Beardsley; Jih I., Oct. 1953, Beardsley. JALUIT: One male and three females, Imrodj, Aug. 1946, Townes; Sydney Pier, Aug. 1946, Townes; Elizabeth I., Sept. 1953, Beardsley. KILI: One male and one female, Oct. 1953, Beardsley. MAJURO: Sixteen males and 19 females, Aug. 1946, Townes. LIKIEP: One female, Likiep I., Aug. 1946, Townes. WOTJE: One male, Nov. 1937, Esaki. ARNO: Ten males, four females, and one nymph, Ine I., Aug. 5, 1950, La Rivers, on *Messerschmidia,* Apr. 1950, Usinger; Kirage I., Oct. 1953, Beardsley. One male, Apr. 1949, Maehler.

DISTRIBUTION: Marshall Is.

This subspecies differs from the female type of *caliginea* from Tahiti (*Delphax caliginea* Stål, 1854, Öfv. K. Vet.-Akad., Förh. **11**: 246) in the more rounded pallid spot on the tegmina.

Lamenia caliginea, as recognized since the time of Stål, has been made to include all species which agree with Stål's description. The holotype is female, and no topotypic males have been described. It is evident from the figures given by Muir (of Samoan material) and by Singh Pruthi (of material of unknown origin) and from the present study that populations in various parts of the Pacific—though conforming reasonably closely to one color pattern—vary quite appreciably in the shape of the male anal segment and of the ornamentation of

the aedeagus. The value of these differences as an indication of reproductive isolation of these populations remains to be proved, but unquestionably they have to be recognized taxonomically. There are other species of *Lamenia,* including some described below, which were formerly grouped around *leucopterus* Kirkaldy under the generic name *Thyrocephalus. Lamenia caliginea* Stål has been recognized as an "end member" of this group, and the generic name *Thyrocephalus* has become superfluous. If, as is probable, these former species of *Thyrocephalus,* which are amply separated from one another, represent the species level in this genus, the *caliginea*-like populations (which, though separate, are not divided by bridgeless gaps) must be reported as subspecies in order to express the group relationships in their correct perspective. This is done here; but if it should be shown that any two of the presumed subspecies of *L. caliginea* are reproductively isolated, the current specific concepts in *Lamenia* will have to be raised to superspecies.

114. Lamenia caliginea onoensis Metcalf.

Lamenia onoensis Metcalf, 1950, B. P. Bishop Mus., Occ. Papers **20** (5): 63.

DISTRIBUTION: Eastern Caroline Is.

KUSAIE. Eighteen males and 17 females. Lele I., Aug. 1946, Oakley; Mt. Tafeayat, 240-360 m., Aug. 1946, Oakley; Mt. Buache, 450-579 m., Aug. 1946, Townes; Matanluk (Yepan), 22 m., Jan. 1953, Gressitt, Jan., Feb. 1953, Clarke; Malem River, 90 m., Apr. 1953, Clarke; "Hill 1010," 300 m., Apr. 1953, Clarke; Funaunpes, 1 m., Jan. 1953, Clarke; Mt. Matante, 280 m., Feb. 1953, Clarke.

115. Lamenia caliginea fullawayi (Muir), new comb. (fig. 45, *b, h*).

Thyrocephalus fullawayi Muir, 1913, Hawaiian Sugar Planters' Assoc. Exper. Sta., Ent. Bull. **12** (1): 41.

DISTRIBUTION: Southern Mariana Is.

S. MARIANA IS. GUAM, 67 males and 50 females: Pt. Amantes, May 1945; 2 km. southeast of Asan, 180-240 m., Oct. 1941, Dybas; Pt. Oca., May, June 1945, Bohart and Gressitt, May, June 1945, Dybas, Dec. 1945, Gressitt; Pt. Ritidian, Dec. 1945, Gressitt, June 1945, Dybas; Asan, Dec. 1945, Gressitt; Mt. Santa Rosa, June 1945, Gressitt; Agana, Feb. 1948, Maehler; Agana Heights, June, July 1945, Wallace, June 1945, Dybas; Talofofo, June 1946, Townes; Mt. Alifan, Aug. 1952, Krauss; Mt. Lamlam, 400 m., Nov. 1952, Gressitt; North Airfield, Mar. 1948, Maehler; Pilgo River, May 1945, Bohart and Gressitt; Potts Junction, Oct. 1952, Krauss; Fadang, June 1945, Dybas; locality unspecified, Jan.-Apr. 1945, Baker.

In coloration this subspecies is distinguished from the preceding by the pale brown margins of the frons and vertex, the tawny-yellow area before

the eyes, the paler subantennal process, the yellow (not pale brown) antennae, and above all by the broadly yellow posterior margin of the lateral pronotal lobes. The male genitalia are illustrated.

116. Lamenia caliginea ponapeana Fennah, n. subsp. (fig. 45, *d*).

In coloration similar to *L. caliginea fullawayi*.

Anal segment with lobes in middle of lateral margin asymmetrical in profile, markedly oblique to main axis of segment. Aedeagus generally as in preceding subspecies; process on left side of aedeagus medially with an obtusely angulate shagreen eminence: the two distal spines both broad at base, but slender in distal half: ventral lobe below phallotreme elongate-triangular and curved dorsad.

Holotype, male (US 62150), Peipalap Pk., Ponape, June-Sept. 1950, Adams. Ponape: Thirteen males, 14 females, and one mutilated specimen, Agric. Exper. Sta.; Peipalap Pk., 180 m.; Matalanim Plantation; Tolenot Pk., all June-Sept. 1950, Adams; Mt. Kupuriso, 600 m., Mar. 1948, Dybas; Nanpil, Nett District, Feb. 1948, Dybas; Hydroelectric Plant, Colonia, Aug. 1946, Townes; Mt. Temwetemwensekir, 180 m., Jan. 1953, Gressitt; 150-300 m., Mar. 1948, Dybas; southeast Nanponmal, Jan. 1953, Gressitt; Palang, west coast, 15 m., Jan. 1953, Gressitt; Colonia-Palikir, Jan. 1938, Esaki; Sankakuyama, July 1939, Esaki; Nipit-Kapiroi, July 1939, Esaki; Japtik, Jan. 1938, Esaki.

CAROLINE ATOLLS: MOKIL: One male, Jan. 1953, Gressitt. PINGELAP: Two females, Jan. 1953, Gressitt. (The last three are tentatively placed here.)

DISTRIBUTION: Eastern Caroline Is.

This subspecies is very similar in all characters to *L. caliginea fullawayi;* but it differs in the greater thickness of the basal portion of both distal spines, in the more elongate lobe below the phallotreme, and in the shape of the lobe from which it arises. Moreover, in *L. caliginea fullawayi* there is a semicircular excavation between this lobe and the base of the larger spine, whereas in the present subspecies the corresponding structure is a fold, as if the notch had been obliterated by compression.

117. Lamenia caliginea sory Fennah, n. subsp. (fig. 45, *f*).

Coloration as in *L. caliginea fullawayi*. Aedeagus closely similar to that of *L. caliginea charon,* but differing in the more strongly sinuate apical flagellar spine. The distinctive features of the genitalia are best understood from the figures.

Holotype, male (US 62157), Moen, Truk, Mt. Tonaachau, Apr. 1949, Potts. Truk: Seven males and seven females, Wena (Moen): Mt. Tonaachau, southern valley, Apr. 2, 1949, Potts; Oct. 1952, Beardsley; July 1939, Esaki; Tol I.: Mt. Unibot, Dec. 1952, Gressitt. Fefan: Mt. Iron, Jan. 1953, Gressitt. Tonoas: Toloas-Erin, Apr. 1940, Yasumatsu and Yoshimura; Dublon, 300-360 m., May 1946, Oakley.

CAROLINE ATOLLS. NOMWIN: One female, Fananu I., Feb. 1954, Beardsley.

DISTRIBUTION: Eastern Caroline Is.

The following small samples are tentatively referred to this subspecies, but the populations from which they come unquestionably require further sampling and closer scrutiny before the picture of subspecies formation in this area can be regarded as complete.

CAROLINE ATOLLS. WOLEAI: Six males and six females, Utegal I., Sept. 1952, Krauss, Feb. 1953, Beardsley; Woleai I., Sept. 1952, Krauss, Feb. 1953, Beardsley; Falalis I., Sept. 1952, Krauss, Feb. 1953, Beardsley. FARAULEP: Four males and one female, Pigue, Sept. 1952, Krauss; Fuasuabukaru, Feb. 1953, Beardsley. SOROL: Two males and one female, Sorol I., Oct. 1952, Krauss. ELATO: Two males and two females, Elato I., Sept. 1952, Krauss, Feb. 1953, Beardsley. SATAWAN: Two males, More, Satawan I., Nov. 1952, Beardsley. LOSAP: Two males, Losap I., Oct. 1952, Beardsley.

The subspecific name is from the Greek *sory,* or ink stone.

118. Lamenia caliginea dira Fennah, n. subsp. (fig. 45, *e*).

Coloration as in *L. caliginea fullawayi.* Aedeagus similar to that of *L. caliginea ponapeana* but with lobe at middle of left dorsal margin evenly convex, not subangulate, and small lobe on ventral margin of left side of flagellum narrowly triangular and distally subacute, not broadly triangular and distally broadly rounded.

Holotype, male (US 62156), Nama, Caroline Is., Dec. 18, 1950, Langford; two males and two females, same data as for type.

DISTRIBUTION: Eastern Caroline Is. (Nama).

This subspecies is not as closely similar to the other subspecies as it is to *ponapeana.*

119. Lamenia caliginea yapana Fennah, n. subsp. (fig. 45, *c*).

Coloration as in *L. caliginea fullawayi* and shape of male genitalia generally similar, but differing as follows: anal segment with ventrolateral lobes distinctly narrower at apex, with relatively less curved sides, and more deeply indented vertically. Aedeagus with the two distal flagellar spines much thickened basally and correspondingly stouter through their whole length than in the Guam material; ventral margin of flagellum at its widest part not at all produced to right or forming a horizontal lobe.

Genital styles as in preceding subspecies.

Holotype, male (US 62151), north Map I., Yap, Caroline Is., July-Aug. 1950, Goss. Yap: Twenty-two males, 26 females, one mutilated specimen, and two nymphs. Yap I.: Central Yap, July-Aug. 1950, Goss; Yaptown, July 1946, Townes; Mt. Matade, 95 m., Dec. 1952, Gressitt; Mt. Gillifitz, 150 m., Nov. 1952, Gressitt; hill behind Yaptown, 60 m., Nov. 1952, Gressitt; Ruul District, Aug. 1950, Goss, Sept. 1939, Esaki; Dugor, 10 m., Dec. 1952, Gressitt, Oct. 1952, Krauss; Sept. 1939, Esaki. Gagil District, July 1946, Oakley; Gagil and Tomil Districts, July-Aug. 1950, Goss. Map I., north and south, both July-Aug. 1950, Goss. Rumung, Oct. 1952, Krauss.

The genitalic differences between this and other subspecies are not very great but they are numerous and best understood by comparison of the figures.

The following small collections are tentatively assigned to this subspecies on grounds of geographical proximity.

PALAU. PELELIU: Two males, Mt. Amiangal, Dec. 1952, Gressitt.

CAROLINE ATOLLS. ULITHI: One male and one female, Mogmog, Oct. 1952, Krauss; Potangeras Islet, Aug. 1945, Baker. NGULU: Two females, Ngulu I., Oct. 1952, Krauss.

DISTRIBUTION: Western Caroline Is.

120. Lamenia caliginea thyestes Fennah, n. subsp. (fig. 45, *i, j*).

Size and coloration as in typical subspecies. Aedeagus conforming to general pattern for the species; a small denticulate ridge on left, followed distally by an ascending tapering subspinose process; on right side a deflexed short broad process with a papery margin; distal process of flagellum sinuately tapering, porrect cephalad.

Holotype, male (US 63145), Kapingamarangi Atoll, 1946, Oakley. Kapingamarangi: Seventeen males and 24 females, Hare Islet, Ueru I., Aug. 1946, Oakley; Machiro I., Aug. 1946, Townes.

DISTRIBUTION: Eastern Caroline Is. (Kapingamarangi).

This subspecies is perhaps nearest in structure to *L. caliginea dira,* but it differs in the shape and curvature of the apical spine of the flagellum and of the spine on the left side. The scroll-like infolding of the lower margin of the distal part of the flagellum (fig. 45, *h,* 1) is also of different shape. This structure is difficult to figure satisfactorily and is closely followed basally by a short projection (fig. 45, *h,* 2) and a short thickened ridge (fig. 45, *h,* 3) in all subspecies of *L. caliginea.*

121. Lamenia caliginea subsp.

Caroline Is. Nukuoro Atoll: One female, Nukuoro I., Aug. 6, 1946, Townes. This cannot be assigned to any of the foregoing subspecies with confidence.

122. Lamenia numitor numitor Fennah, n. sp. (fig. 47, *f*).

Vertex 1.4 times broader at widest part than at apex, lateral margins sinuately convex, converging distad, much thickened and studded on each side with about eight ceriferous pits, and prolonged for a quarter of its length basad of posterior margin, which is subvertically elevated, anterior margin transverse, disc hollowed longitudinally in a U-shaped sulcus, broader at base. Mesoscutellum rounded at tip.

Sordid white, powdered white in life, abdomen creamy yellow: frons narrowly on basal and lateral marginal carinae and mesonotum fuscous. Tegmina hyaline, powdered white; veins of disc concolorous except first claval vein, this and apical veins grayish fuscous. Wings faintly suffused fuscous, powdered white, veins light fuscous.

Pygofer short dorsally, longer ventrally, laterodorsal angles shortly and acutely produced, ventral posterior margin transverse, entire. Anal segment elongate-ovate, anal style situated close to base, apex rounded, medially incised. Aedeagus not very long, tubular, slightly curved dorsad distally, a compact row of about six minute teeth on ventral surface at middle and about six more widely spaced teeth ventrolaterally on left toward apex; on left upper margin near base a convex lobe directed laterad; flagellum short, broadly tubular in basal half with a slender straight spine near base on left directed laterad and a short spine at apex of right side (which is short) directed cephalad; left side of flagellum distally produced in a large subvertical triangular lobe, broadly falcate distally, this lobe

bearing on its mesial surface a rather thickened horizontal lobe; dorsally two slender spines directed cephalad, one subtending base of triangular lobe, the other projecting cephalad from its distal upper margin. Genital styles long and narrow, with dorsal margin shallowly sinuate, strongly curved mesad and tapering distally but with only a very short sclerotized point at apex, the base of this with two long setae; a semicircular lobe on inner surface about one-third from base bearing a few fine setae, distad of this, near middle, a stout curved spine, directed mesad; at apical third a small setigerous papilla.

Pregenital sternite of female produced caudad, forming medially an almost semicircularly rounded lobe.

Male: length 2.9 mm., tegmen 4.2 mm.; *female:* length 3.4 mm., tegmen 4.8 mm.

Holotype, male (US 62152), Gagil District, Gagil-Tomil, Yap, July-Aug. 1950, Goss. Yap: Three males, six females, and 30 nymphs; Yap I., south and central; Ruul District, Aug. 1950, Goss. Gagil-Tomil: Gagil, July-Aug. 1950, Goss, Oct. 1952, Krauss. Map I., Oct. 1952, Krauss.

One mutilated specimen is from Yigo, Guam, (Aug. 1952, Krauss) and one male is from Ngulu Atoll, Ngulu I. (Oct. 1952, Krauss).

DISTRIBUTION: Western Caroline Is.; Guam.

Lamenia numitor differs from *L. pallidinervis* Muir in the shape of the anal segment, the aedeagus, and the genital styles; and it differs markedly from *L. albicosta* Muir in the shape of the genital styles.

123. **Lamenia numitor buto** Fennah, n. subsp. (figs. 46, *b, e, h;* 47, *c-e*).

Of same form and size as typical subspecies.

Stramineous to golden yellow; disc of frons and sides of head pale orange; subantennal process, antennae, pronotum, and tegulae at base pallid stramineous, almost creamy white, vertex slightly darker; lateral margins of frons dark fuscous; mesonotum pale castaneous. Tegmina translucent, sordid white or suffused sordid yellow except on costal margin, which is pale; all veins narrowly or broadly fuscous, occasionally fuscous spreading over whole corium. Wings sordid white with sepia-fuscous veins.

Aedeagus as in typical subspecies, but with second of the three spines on left side distinctly shorter; structure below phallotreme on distal part of flagellum corresponding to thickened horizontal lobe of typical subspecies is here in the form of a broad vertical lobe slightly tapering distad.

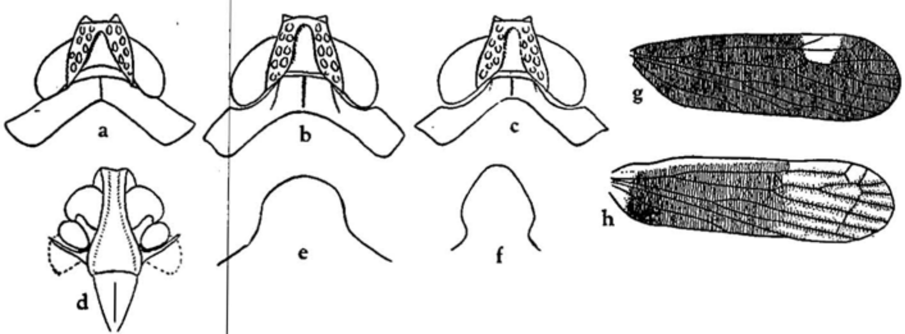


FIGURE 46.—**a, f, g,** *Lamenia caliginea charon: a,* vertex and pronotum; *f,* posterior margin of pregenital sternite of female; *g,* tegmen. **b, e, h,** *L. numitor buto: b,* vertex and pronotum; *e,* posterior margin of pregenital sternite of female; *h,* tegmen (Peleliu specimen); **c, d,** *L. candida: c,* vertex and pronotum; *d,* frons and clypeus.

Holotype, male (US 62153), Ulimang, Babelthuap, Palau Is., Dec. 16, 1947, Dybas. Palau: Kayangel, three males and one female, Ngajangel, Dec. 1952, Gressitt. Babelthuap, five males and two females, Ulimang, on young pomelo leaves, Dec. 16, 1947, Dybas; Gakap, July 1946, Townes; Ngeremeskang, 25 m., Dec. 1952, Gressitt; Marukyoku, Feb. 1936, Esaki. Koror, six males and 14 females, July 1946, Townes, July 1946, Oakley, Sept. 1952, Krauss, Nov. 1947, Dybas, Oct. 1952, May, July, Aug. 1953, Beardsley, July 1946, Townes. Peleliu, seven females, July 1945, Dybas; Mt. Amiangal, Dec. 1952, Gressitt, June 1945, Hagen. Angaur, one male and two females, Aug. 1945, Feb. 1948, Dybas.

CAROLINE ATOLLS. Tobi: One male, Sept. 1952, Krauss. Pulo Anna: One male and one female, Sept. 1952, Krauss.

DISTRIBUTION: Western Caroline Is.

This subspecies is well distinguished by coloration and by the aedeagal characters cited.

124. Lamenia numitor sordida Fennah, n. subsp. (fig. 47, *a, b*).

Of same form and size as typical subspecies.

Stramineous; genae and lateral margins of frons, a faint suffusion distally on clypeus and mesopleura, and mesonotum fuscous. Tegmina hyaline, more or less opaque with powdering of wax; anterior half of costal cell throughout its length, and membrane near anterior margin pallid grayish white, remainder of tegmen suffused fuscous, with veins heavily overlain dark fuscous. Wings sordid white with fuscous veins.

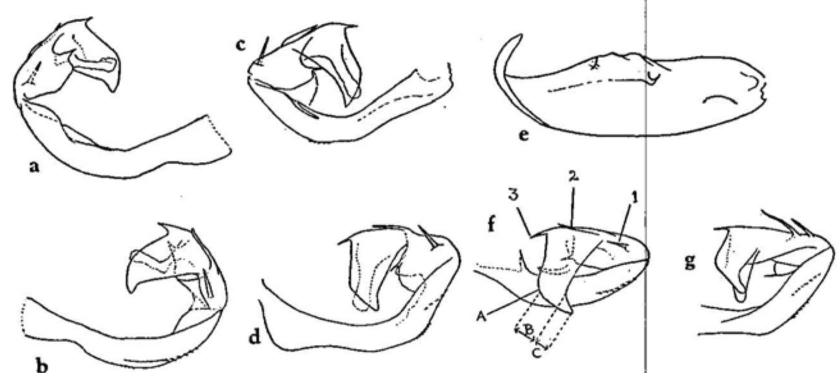


FIGURE 47.—a, b, *Lamenia numitor sordida: a,* aedeagus, right side; *b,* aedeagus, left side. c-e, *L. n. buto: c,* aedeagus, right side; *d,* aedeagus, left side; *e,* right genital style, dorsal view. f, *L. n. numitor,* aedeagus, left side (1-3 spines); g, *L. n. procne,* aedeagus, left side.

Holotype, male (US 62154), Agric. Exper. Sta., Ponape, Caroline Is., July-Sept. 1950, Adams. Ponape: Three males, two females, and two nymphs; Agric. Exper. Sta., July-Sept. 1950, Adams; Nov. 1953, Beardsley. Nukuoro Atoll: One male, Nukuoro I., Aug. 1946, Townes.

DISTRIBUTION: Eastern Caroline Is.

This subspecies is easily recognized by the venation being boldly picked out in dark fuscous. In the aedeagus the dorsal margin of the distal flagellar lobe is evenly curved, not angulate as in the Yap and Palau populations.

125. Lamenia numitor procne Fennah, n. subsp. (fig. 47, *g*).

Size and coloration as in typical subspecies. Aedeagus of same general pattern; the longer dorsal spine on aedeagal flagellum slightly sinuate, and the two distal lobes shaped as in figure.

Holotype, male (US 63146), Hare Islet, Kapingamarangi Atoll, eastern Caroline Is., Aug. 1946, Townes. Kapingamarangi: Seventy-three males and 22 females, Hare Islet, Machiro I., Aug. 1946, Townes; Ueru I., Aug. 1946, Oakley.

DISTRIBUTION: Eastern Caroline Is. (Kapingamarangi).

This subspecies is nearest in genital structure to the type species from Yap and is distinguished most readily by the shape of the distal lobe of the flagellum. The most easily noted differences between the aedeagal ornamentation of the four subspecies of *L. numitor* are as follows: In *L. numitor numitor* spine 1 (fig. 47, *f*) is relatively shorter than in the other subspecies, spine 2 is longer than in *buto,* and spine 3 is longer than in *buto* and *sordida;* the apical lobe of the flagellum in profile is more rounded at A than in other subspecies except *sordida,* and the ratio of lengths B, C is distinctive. In *L. numitor buto* spine 1 is longer than in *numitor,* spine 2 is relatively shorter than in all other subspecies, and spine 3 is shorter than in *numitor* and *procne;* the curve at A is subangulate, more so than in *numitor* and *sordida,* the ratio of lengths B, C is distinctive, nearest to *Sordida.* In *L. numitor sordida* spine 1 is relatively shorter than in *buto,* spine 2 is about as long as in *numitor* and *procne,* and spine 3 is slightly shorter than in all other subspecies; the curve at A on the profile of the distal lobe is smoothly rounded; the ratio of lengths B, C is distinctive. In *L. numitor procne* spines 1, 2, and 3 are relatively long; the curve at A on the profile of the distal lobe is angulate, more acutely so than in other subspecies; and the ratio of lengths B, C is distinctive. It will be noted that the actual shape of the distal lobe differs between subspecies.

126. Lamenia candida Fennah, n. sp. (figs. 46, *c, d;* 48, *d, e*).

Closely similar in general form to preceding species, but with vertex relatively longer and its lateral margins narrower; tip of mesoscutellum acute. Antennae of male much swollen, larger than eyes and concealing subantennal processes.

Stramineous; clypeus, pleura, legs except apical segment of pro- and mesotarsi, and ventral surface of abdomen lightly suffused grayish fuscous; apical joint of rostrum, and of pro- and mesotarsi fuscous. Tegmina hyaline, powdered white, with white veins, stigma distally (or entirely) and occasionally R and M near stigma fuscous. Wings hyaline, powdered white, with white veins.

Pygofer short dorsally, longer ventrally, dorsolateral angles acute, but very little produced. Anal segment about 2.5 times as long as broad, lateral margins in dorsal view weakly convex, converging distally to apex, which is apparently incised, though in fact

shallowly concave with a thin membrane across apparent incision. Aedeagus tubular, shallowly curved, left dorsal margin entire, distally shallowly convex, slightly produced dorsad, right margin broadly and shallowly excavate distally; flagellum larger than basal portion of aedeagus and comprising three large lobes, one above the other: ventral lobe very deep at base on right, narrowing distally and produced to left so as to overlie basal part of aedeagus like a broad ledge, the second process, overlying the ventral, comprising a shallowly troughlike plate convex on its left side and very obliquely truncate distally, so that apex is acute; dorsal lobe, partly overlying the second distally, rather narrow at its base, porrect cephalad and dilated into a trapezoidal lobe distally, rounded-acute at its tip. Genital styles long, narrow and parallel-sided in basal three-fifths, strongly dilated ventrally in subapical fifth and tapering to slender incurved apex in apical fifth; a thick oblique lobe on inner face two-fifths from base, bearing about 12 subspinose setae; directly above this, a setiferous eminence with a short stout curved spine; a shallow sparsely setiferous eminence on inner surface of style four-fifths from base; two small obscure setae at base of apical spine, which is very short and consists of a further sclerotization of the produced apical angle.

Male: length 3.3 mm., tegmen 4.9 mm.; *female:* length 3.5 mm., tegmen 4.7 mm.

Holotype, male (CM), Peleliu, Aug. 10, 1945, Dybas.

PALAU. Babelthuap: Two females, Ulimang, Dec. 1947, Dybas; Ngeremeskang, 25 m., Dec. 1952, Gressitt. Koror: One male and one female, Nov. 1947, Dybas. Peleliu: One male, east coast, Aug. 10, 1945, Dybas.

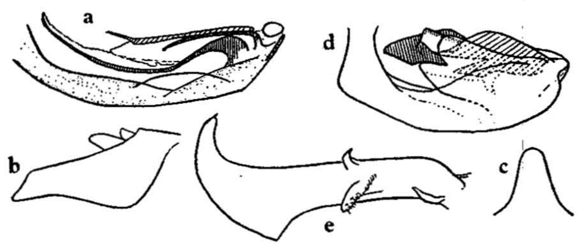


Figure 48.—a-c, *Nesorhamma chalcas chalcas: a,* aedeagus; *b,* anal segment of male; *c,* medioventral process of pygofer. d, e, *Lamenia candida: d,* aedeagus; *e,* genital style.

YAP. Four males and six females. Yap: Yaptown, July 1946, Townes; Mt. Matade, 60 m., Dec. 1952, Gressitt, Oct. 1952, Krauss; hill behind Yaptown, 60 m., Nov. 1952, Gressitt. Map: Oct. 1952, Krauss.

CAROLINE ATOLLS. Ngaiangl: One male, Ngaiangl I., Dec. 1952, Gressitt. Ngulu: One female, Ngulu I., Oct. 1952, Krauss.

One female is from Guam (Mt. Alifan, Aug. 1952, Krauss).

DISTRIBUTION: Western Caroline Is., southern Mariana Is.

L. candida is the geographical representative of *L. pseudotypica* Muir. It differs in the less elongate anal segment, which in *L. pseudotypica* is prolonged much farther behind the anal foramen and is longitudinally channeled and apically distinctly excavate. There is a difference in the shape of the apical aedeagal lobe and, to a slight extent, in the coloration of the tegmina.

Genus **Phaciocephalus** Kirkaldy

Phaciocephalus Kirkaldy, 1906, Hawaiian Sugar Planters' Assoc. Exper. Sta., Ent. Bull. **1** (9) : 426 (haplotype: *Phaciocephalus vitiensis* Kirkaldy, op. cit., p. 428).

Vertex about as broad as long, distally rounding into frons, lateral margins broad, converging apically but not quite meeting, posterior margin broadly concave; frons about 1.7 times as long as broad, narrowest between eyes, lateral margins elevated and thickened, shallowly concave to below level of antennae then weakly convex to frontoclypeal suture, disc of frons deeply sunken; clypeus about as long as frons, strongly tricarinate; lateral ocelli present, antennae with first segment broader than long, with one side strongly convex, second segment ovate; rostrum much surpassing post-trochanters. Pronotum moderately long, anteriorly fitting closely against head, median carina strongly developed, lateral carinae of discal area feebly indicated near posterior margin, absent elsewhere, lateral marginal carinae strongly elevated, lower pronotal margins produced anteriorly to form a fovea with preceding, hind margin of pronotum obtusely angulate at middle; mesonotum much broader than long, distinctly tricarinate, with lateral carinae sinuate, converging posteriorly; post-tibiae laterally unarmed, six-toothed along apical margin; basal metatarsal segment seven-toothed, second metatarsal five-toothed. Tegmina 3.3 times as long as broad, of subequal width throughout, apical margin almost semicircularly rounded, Sc+R forked one-quarter from base, first M fork about level with claval apex, Cu_1 fork slightly basad of level of union of claval veins, R with three veins reaching apical margin, M with five, and Cu_1 with two, six subapical cells present, each longer than corresponding apical cell; claval veins united slightly basad of middle of tegmina; first claval vein pustulate.

Anal segment of male narrow, elongate. Pygofer short dorsally, rather long ventrally, with ventral posterior margin broadly and strongly produced caudad.

Pregenital sternite of female strongly produced caudad in a broad subquadrate lobe.

127. **Phaciocephalus zethus** Fennah, n. sp. (figs. 49, *a-d;* 50, *a-d*).

Stramineous; vertex, pronotum and mesonotum yellow. Tegmina hyaline with very pale-yellow suffusion in costal cell and on membrane, shading evenly into orange; Sc, R, and apical veins pale yellow, remainder orange, darker than ground color; sometimes a dark fuscous band between M and Cu_2 (claval sutural vein) to level of apex of clavus, then curved diffusely across to Sc at margin, infuscation much lighter distad of claval apex; a short stripe between claval veins fuscous.

Anal segment of male elongate, in dorsal view narrow, parallel-sided, with anal foramen at apex; in profile with dorsal margin straight, ventral margin almost parallel, ventral surface hollowed out distally. Pygofer with laterodorsal angles not produced, lateral margins straight, oblique, ventral posterior margin strongly produced caudad in a very broad

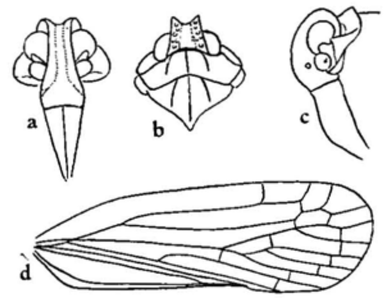


FIGURE 49.—*Phaciocephalus zethus:* **a**, frons and clypeus; **b**, head and thorax; **c**, head in profile; **d**, tegmen.

plate, distally convex-truncate with angles rounded. Aedeagus tubular, shallowly curved upward distally, a pair of unequal, moderately long slender spines dorsally at apex directed cephalad; below these the flagellum extends cephalad as a short mass of membranous tissue, drawn out distally into spine-like prolongations, of which there are five on left side and two or more obscurely below; a pair of very long processes arising at apex and overlying aedeagus to its base, each process narrow basally, expanded and flattened one-third from base, then abruptly tapering into a long thin spine. Genital styles rather short and broad, dorsal margin more or less straight, with two processes arising two-fifths from base, one of these a short curved spine, the other long, membranous, rounded at apex; distad of these processes a short vertical plate on inner surface; ventral margin of styles sinuate, a triangular lobe near base projecting ventrad, supporting a vertical sclerite, which is directed mesad and minutely crenulate on its margin; apical margin convex, its lower angle produced in a narrow tapering process which curves mesad.

Pregenital sternite of female produced caudad in a broad lobe, narrowing distally and shallowly convex on apical margin.

Male: length 2.8 mm., tegmen 4.0 mm.; *female:* length 3.1 mm., tegmen 4.2 mm.

Holotype, male (US 62145), Mt. Temwetemwensekir, Ponape, Feb. 29, 1948, Dybas.

PALAU. PELELIU: One male, July 1946, Townes.

PONAPE. Sixty-one males and 58 females: Matalanim, Nov. 1953, Beardsley; Mt. Temwetemwensekir, 150-420 m., Feb. 1948, Dybas, 180 m., Jan. 1953, Gressitt, June-Sept. 1950, Adams; Mt. Kupuriso, north slope, 300-450 m., Mar. 1940, Dybas; Mt. Nanalaud, June-Sept. 1950, Adams; Nanpil, Net District, Feb. 1948, Dybas; Agric. Exper. Sta., Peipalap Pk., Tolotom, 730 m., all July-Sept. 1950, Adams; Hydroelectric Plant, Colonia, Aug. 1946, Townes, Nov. 1953, Beardsley; Mt. Dolennankap, 540 m., Aug. 1946, Townes; Palang, north coast, 15 m., Jan. 1953, Gressitt; southeast Nanponmal, Jan. 1953, Gressitt; Jokaj I., 2 m., Jan. 1953, Gressitt.

DISTRIBUTION: Caroline Is. (Palau, Ponape).

This species is well distinguished from *P. carolinensis* Metcalf by numerous details of aedeagal structure as revealed in the figures, as well as by the shape of the pregenital sternite of the female and by coloration.

128. Phaciocephalus carolinensis Metcalf (fig. 50, *m-o*).

Phaciocephalus carolinensis Metcalf, 1954, Elisha Mitchell Sci. Soc., Jour. **70** (1): 10.

Of same size and build as preceding species.

Stramineous; mesonotum pale yellowish brown, sometimes castaneous on disc; pro-coxae, profemora, pro- and mesotarsi distally, and abdominal tergites lightly suffused grayish fuscous. Tegmina between costal margin and M hyaline, sometimes with a yellow suffusion nearer base, sometimes fuscous at base; elsewhere more or less infuscate, with yellow veins, except in basal three-quarters of clavus, which is either yellow with an orange suffusion or sordid yellow with a crimson suffusion between anterior vein and margin.

Anal segment of male moderately long, in dorsal view narrow, with sides very slightly diverging distally, with anal foramen at apex, lateroapical angles strongly produced, abruptly acuminate at tip, apical margin deeply excavate. Pygofer with laterodorsal angles not produced, lateral margins straight, oblique, ventral posterior margin broadly produced caudad, truncate at apex with angles rounded. Aedeagus tubular, slightly upcurved distally, a pair of extremely short vertical spines at apex, flagellum comprising five pairs of

spinose processes, the upper pair rather heavily pigmented, distally decurved; the second pair flattened, vertical, lanceolate, porrect cephalad, surpassing all other processes; the third pair rather heavily pigmented, about three-fifths as long as the second, and of approximately the same shape, the fourth pair lightly pigmented, sinuately decurved, the fifth pair longer than all except the second, which they resemble in general shape. Genital styles narrow at base, broadened into a rounded-quadrate lobe distally in side view, lower margin shallowly sinuate with a rounded lobe projecting mesad at middle; directly above this, on dorsal margin, a vertical process giving off two fingerlike lobes directed dorsocaudad; slightly distad of this, on inner surface of ascending margin a short triangular lobe, distally acute; apical margin with lower angle produced.



FIGURE 50.—**a-d,** *Phaciocephalus zethus: a,* anal segment of male; *b,* medioventral process of pygofer; *c,* aedeagus; *d,* pregenital sternite of female. **e-h,** *P. paschalis: e,* anal segment, pygofer, and genital style; *f,* medioventral process of pygofer; *g,* aedeagus; *h,* pregenital sternite of female. **i-l,** *P. phaedra: i,* anal segment, pygofer, and genital style; *j,* medioventral process of pygofer; *k,* aedeagus; *l,* pregenital sternite of female. **m-o,** *P. carolinensis: m,* anal segment of male; *n,* pregenital sternite of female; *o,* aedeagus. **p-t,** *P. onoi: p,* anal segment, posterior margin of pygofer and genital style, left side; *q,* aedeagus, left side; *r,* processes of aedeagus; *s,* medioventral process of pygofer; *t,* posterior margin of pregenital sternite.

Pregenital sternite of female produced caudad in a pigmented rectangulate lobe, moderately broader than long, with its distal angles rounded.

Male: length 2.8 mm., tegmen 3.2 mm.; *female:* length 3.4 mm., tegmen 3.8 mm.

DISTRIBUTION: Caroline Is.

CAROLINE ATOLLS. NGAIANGL: Ngariungs, two females, Dec. 1952, Gressitt. NOMWIN: Six males and five females, Feb. 1953, Beardsley; May 1946, on palms, Oakley.

TRUK. One hundred and thirty-five males and 122 females. FEFAN: Mt. Iron, 180 m., Jan. 1953, Gressitt; Mesa-Urunna, Nov. 1937, Esaki. TON (Tol): Pata, Sabote-Epin, Apr. 1940, Yasumatsu and Yoshimura; Olej, Apr. 1940, Yasumatsu and Yoshimura; Mt. Unibot, Sept. 1952, Gressitt, May 1946, Townes, Dec. 1952, 25-50 m., Gressitt. TONOAS (Dublon): Feb. 1948, Maehler, Oct. 1952, Beardsley. WENA (Moen): 150 m., 180 m., June, July, 1946, Townes, Feb. 5-9, 1948, on *Wedelia biflora,* Feb. 1948, Maehler; north basin, Mt. Teroken, Mar. 1949, Potts, Oct., Dec. 1952, Beardsley; northern slope, Mar. 1949, Potts; Mt. Tonaachau, southern valley, Apr. 1949, Epinup, Mar. 1949, Potts; Civil Administration area, Feb. 1949, Potts; Nofo, Mt. Winifourer, Feb. 1949, Potts and 12 m., May 1946, Oakley.

129. **Phaciocephalus phaedra** Fennah, n. sp. (fig. 50, *i-l*).

Generally similar to *P. zethus.*

Stramineous; mesonotum posterolaterally pale brown; pro- and mesocoxae, mesopleura and profemora sometimes lightly suffused grayish fuscous; abdomen dorsally dark fuscous, genitalia fuscous piceous. Tegmina hyaline, powdered white in a broad band from base to apex between costal margin and M; a short stripe near base of costal cell, and a suffusion bordering the pallid area throughout its length, broadening on membrane, fuscous; tegmina between this and posterior margin sordid yellow with faint fuscous suffusion. Wings grayish white, infuscate distally between R and M and posteriorly, veins dark fuscous.

Anal segment of male long and narrow, in profile with dorsal and ventral margins parallel in basal half, ventral margin thence curving downward; anal foramen slightly basad of apex, lateroapical angles produced and decurved, apical margin excavate. Pygofer with laterodorsal angles not produced, lateral margins shallowly convex, ventral margin thickened, strongly produced caudad in a triangular process, broad at base and curved upward distally. Aedeagus long, shallowly curved upward distally, a pair of slender equal spines arising at apex, directed cephalad, below these two pairs of processes, one inside the other, the inner pair heavily pigmented, rather broad on basal two-thirds, narrowly tapering on apical third; the outer pair lightly pigmented, broad, and distally bifurcate, below these processes a median vertical lobe, ovate in profile. Genital styles narrow at base, broadened into a rounded-subquadrate lobe distally; lower margin in side view shallowly concave with an acutely triangular lobe projecting mesocephalad at middle; directly above this, on dorsal margin, a vertical process giving off two narrow fingerlike processes, the shorter recurved and acute at tip, both directed dorsocaudad; slightly distad of this, on inner surface of ascending margin, a short narrowly triangular lobe; apical margin with lower angle triangularly produced mesad.

Pregenital sternite of female produced caudad in a quadrate lobe slightly longer than broad, with its apical margin transverse and angles rounded.

Male: length 3.1 mm., tegmen 4.0 mm.; *female:* length 3.4 mm., tegmen 4.5 mm.

Holotype, male (US 62147), Ponape, Agric. Exper. Sta., June-Sept. 1950, P. A. Adams.

S. MARIANA IS. SAIPAN: One female, Maehler.

CAROLINE ATOLLS. SATAWAN: One female, Nov. 1952, Beardsley. NAMA: Three males, Oct. 1953, Beardsley. NOMWIN: Two males, Fananu I., Feb. 1954, Beardsley.

TRUK. Twenty-eight males and 25 females. WENA (Moen): Mt. Tonaachau, south slope, Feb., Mar., 1949, Potts: Mt. Teroken, lower north slope, Apr. 1949, Potts, Feb. 1953, Gressitt; Mt. Chukumong, north basin, Mar. 1949, Potts, 180 m., July 1946 on *Alocasia,* Townes, 0-120 m., May 1946, Oakley, Oct. 1952, Beardsley. FEFAN: May 1946, Oakley, Jan. 1953, Gressitt. TON: Mt. Unibot, 200 m., Dec. 1952, Gressitt.

PONAPE. Seventeen males and 18 females: Mt. Temwetemwensekir, 100 m., Jan. 1953, Gressitt, 150-300 m., Feb. 1948, Dybas; Agric. Exper. Sta., Mt. Tolotom, 510 m., June-Sept. 1950, Adams; Colonia, June-Sept. 1950, Adams; Jan. 1953, Clarke; south Nanponmal, Jan. 1953, Clarke, Jan. 1953, Gressitt; Hydroelectric Plant, Aug. 1946, Townes.

KUSAIE. Ten males, 34 females, and one mutilated specimen: Mutunlik, 22 m., Jan., Feb. 1953, Clarke, Gressitt; "Hill 1010," 300 m., Apr. 1953, Feb. 1953, Clarke; Lele I., 100 m., Feb. 1953, Clarke; "Hill 541," 165 m., Mar. 1953, Clarke; Mt. Matante, 380 m., Feb. 1953, Malem River, 60 m., Apr. 1953, Clarke; Mt. Tafeayat, 150-240 m., Aug. 1946, Oakley.

DISTRIBUTION: Southern Mariana Is. (Saipan), Caroline Is.

This species resembles *P. zethus* but differs in the coloration of the clavus, in the tegmina, and in the fuscous-piceous hue of the genitalia in both sexes. Morphologically, it differs from the remainder in the shape of the anal segment and genitalia of the male and of the pregenital sternite of the female.

130. **Phaciocephalus paschalis** Fennah, n. sp. (fig. 50, *e-h*).

Yellow; clypeus, rostrum, legs, and ventral surface of abdomen pallid, almost white; mesonotum laterally faintly tinged fuscous. Tegmina hyaline, a rather narrow band lying between M and Cu as far as nodal line, then curved anteriorly to reach R at apex, fuscous, darker distally; membrane sordid hyaline; clavus sordid yellow; veins concolorous, yellowish in membrane. Wings hyaline, powdered white, veins concolorous.

Anal segment of male elongate, of same general shape as in *P. zethus,* lateroapical angles acutely produced caudoventrad. Pygofer with laterodorsal angles not produced, lateral margins oblique, weakly sinuate, ventral posterior margin strongly produced caudad in a quadrate lobe narrower at apex than at base and with sides concave.

Aedeagus tubular, shallowly curved upward distally, a pair of slender equal spines dorsally at apex directed cephalad; flagellum in form of a short broad tube; its ventral margin distally shortly produced in two pairs of spines, one longer than the other; its lateral margin shallowly convex, produced where it meets dorsal margin in a long slender spine, porrect cephalad, the spine on right side distinctly longer than that on left; dorsal margin of flagellum near its sides produced in a pair of very long slender sinuate spines which extend cephalad for three-quarters of length of aedeagus. Genital styles as in *P. zethus.*

Pregenital sternite of female produced caudad in a broad and rather long scoop-shaped lobe convex on distal margin.

Male: length 2.8 mm., tegmen 4.0 mm.; *female:* length 2.5 mm., tegmen 4.0 mm.

Holotype, male (US 63147), Mt. Winifourer, Wena, Truk, Feb. 25, 1949, Potts.

CAROLINE ATOLLS. NAMA: Three males and six females, Feb. 1949, Potts; Dec. 1950, Langford; Oct. 1952, Beardsley.

TRUK. Forty-five males and 28 females. WENA (Moen): May 1946, Oakley; 180 m., July 1946, Townes; Nofo, Mt. Winifourer, Feb. 25, 1949, Potts; Mt. Tonaachau, south valley, Apr. 1949, Mt. Teroken, lower north slope, Mar. 1949, Potts; Mt. Chukumong, north basin, Mar. 1949, Potts. TONOAS (Dublon): Oct. 1952, Beardsley. TON: Mt. Unibot, Mar. 1946, Townes.

PONAPE. Three males and nine females: Mt. Temwetemwensekir, 100 m., Jan. 1953, Gressitt; Mt. Kupuriso, summit, 600 m., Mar. 1948, Dybas; Palang, east coast, 15 m., Jan. 1953, Gressitt; Colonia, Paliker, Ronkiti, One, Nampir, Dec. 1937, Jan. 1938, July 1939, Esaki.

DISTRIBUTION: Eastern Caroline Is.

This species is distinguished by the shape of the medioventral process of the pygofer, by the shape of the aedeagal processes and that of the pregenital sternite of the female, and by coloring.

131. Phaciocephalus onoi Metcalf (fig. 50, *p-t*).

Phaciocephalus onoi Metcalf, 1954, Elisha Mitchell Sci. Soc., Jour. **70** (1): 10.

Creamy white, sometimes with uneven rosy suffusion; mesonotum, usually abdominal tergites, genitalia and sometimes profemora dark fuscous. Tegmina hyaline, anterior half, except for a spot at base of costa, pallid, powdered grayish white; a spot at base of costa and a suffusion from fork of Cu across posterodistal half of tegmen to R at margin fuscous; posterior portion of clavus roseate. Wings pallid, suffused fuscous across medial area, with veins concolorous.

Anal segment of male moderately long, lateroapical angles acuminately produced and decurved, apical margin deeply excavate, in profile lower lateral margin sinuate. Pygofer with lateral margins straight, medioventral process subquadrate, narrowed distally, apical margin shallowly convex. Aedeagus tubular, shallowly curved upward distally, apically with four pairs of spinose processes directed cephalad above aedeagus; basal pair of these processes short, terete, decurved, second and third pairs situated sublaterally, more or less laterally compressed, subequal in length and longer than first pair; fourth pair much longer than others, broad, parallel-sided and laterally compressed in basal two-thirds, abruptly narrowed, then slender terete to apex. Genital styles narrow near base, ventral margin straight with a short blunt lobe directed mesad near middle; dorsal margin strongly convex distally, then deeply excavate and finally ascending to acute apex; a long, slightly curved fingerlike process near base.

Male: length 3.1 mm., tegmen 3.9 mm.; *female:* length 2.9 mm., tegmen 4.2 mm.

DISTRIBUTION: Eastern Caroline Is.

TRUK. Eighteen males and 16 females. TON (Tol): Jan. 1949, Maehler; Mt. Unibot, 390 m., Dec. 1952, Gressitt; Sabote, Pata, Apr. 1940, Yasumatsu

and Yoshimura. TONOAS: Dublon, Feb. 1948, on *Wedelia biflora* and breadfruit, Maehler; Toloas, Jan. 1938, Esaki. WENA: Moen, 180 m., July 31, 1946, on *Artocarpus altilis,* Townes, Feb. 1948, Dybas, Oct. 1952, Beardsley; Mt. Teroken, Dec. 1952, Gressitt.

TRIBE RHOTANINI

KEY TO GENERA OF RHOTANINI

1. Tegmina not more than twice as long as broad, usually less 2
   Tegmina at least twice as long as broad 3

2 (1). Frons with lateral carinae not at all contiguous .... **Decora** Dammerman
   Frons with lateral carinae contiguous at least basally .... **Rhotana** Walker

3 (1). Second antennal segment at least twice as long as broad 4
   Second antennal segment little longer than broad .... **Levu** Kirkaldy

4 (3). Second antennal segment robust, tumid, more than twice as long as broad; frons not strongly compressed distally; base of M and Cu widely separated .... **Alara** Distant
   Second antennal segment not exceptionally large, barely twice as long as broad; frons compressed throughout; M and Cu branching together from Sc+R .... **Sumangala** Distant

Genus **Levu** Kirkaldy

Levu Kirkaldy, 1906, Hawaiian Sugar Planters' Assoc. Exper. Sta., Ent. Bull. **1** (9) : 434 (haplotype: *Levu vitiensis* Kirkaldy, op. cit.).

Muiralyricen Metcalf, 1946, B. P. Bishop Mus., Bull. **189** : 114 (orthotype: *Muiralyricen ruber* Metcalf, op. cit.).

Malpa Metcalf, 1954, Elisha Mitchell Sci. Soc., Jour. **70** (1) : 11 (orthotype: *Malpa appressa* Metcalf).

The frons and vertex in this genus are very much compressed and the lateral carinae foliate: it is permissible to describe the face as linear, but not to claim that the lateral carinae are contiguous, since there is a complete range from a single thin lamina extending from base of vertex to near apex of frons to two laminae which, though closely apposed, do not touch.

132. Levu matsumurae guamana Fennah, new name (fig. 51, *d, e*).

Muiralyricen ruber Metcalf, 1946, B. P. Bishop Mus., Bull. **189** : 114 (preoccupied by *Levu rubra* Muir).

Muiralyricen was erected as a new genus in the tribe Otiocerini. Examination of the type species, however, shows it to be a member of the tribe Rhotanini, and in my opinion, generically inseparable from *Levu* Kirkaldy. The Guam population accordingly takes the name *Levu rubrum* (Metcalf), new combination. This name, however, is preoccupied by *Levu rubrum* Muir [1913, Hawaiian Sugar Planters' Assoc. Exper. Sta., Ent. Bull. **12** (1) : 85]. I do not find it possible, on the data available, to separate this population on characters

of recognized specific value from *L. matsumurae* Muir, and provisionally treat it and the three that follow as subspecies of *L. matsumurae*. *Malpa,* based on a single female specimen, was also described as a new otiocerine genus. I have not seen the type species, but its counterparts elsewhere, together with the original figures, show it to be congeneric with *Levu.*

The population on Guam differs from Formosan material (on which the species was erected) in the absence of dark spots from the basal half of Sc in the tegmina, and of a brown mark from the hind margin to the first median sector.

DISTRIBUTION: Southern Mariana Is.

S. MARIANA IS. GUAM, eight males and nine females: Pago, May 1945, Bohart and Gressitt; Sumang River, May 1945, Bohart and Gressitt; Mt.

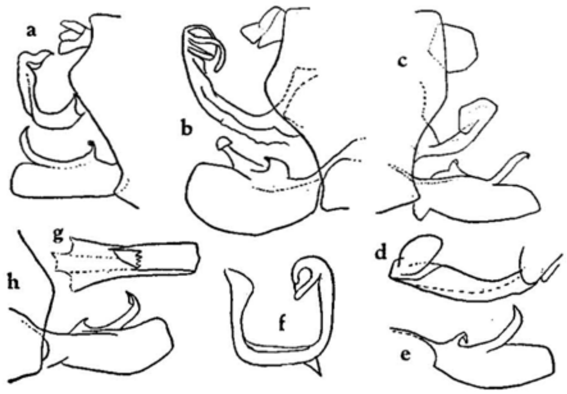


FIGURE 51.—**a,** *Levu matsumurae ponapeana,* male genitalia; **b,** *L. pallescens pagana,* male genitalia; **c,** *L. matsumurae palauensis,* male genitalia; **d, e,** *L. m. guamana: d,* aedeagus; *e,* genital style; **f-h,** *L. pallescens lactinea: f,* aedeagus; *g,* aedeagus, dorsal view; *h,* genital style.

Santa Rosa, May 1945, Bohart and Gressitt; Ordot, May 1945, Bohart and Gressitt; Pt. Oca, May, June 1945, Bohart and Gressitt; Pt. Ritidian, Oct. 1952, Krauss; Mt. Lamlam, 400 m., Oct. 1952, Krauss, Nov. 1952, Gressitt; Mt. Alifan, Aug. 1952, Krauss; Mt. Balanos, Aug. 1952, Krauss; Fadang, June 1945, Dybas.

133. Levu matsumurae appressa (Metcalf), new comb.

Malpa appressa Metcalf, 1954, Elisha Mitchell Sci. Soc., Jour. **70** (1): 11. The type locality is given as Truk Island.

134. Levu matsumurae ponapeana Fennah, n. subsp. (fig. 51, *a*).

Junction of vertex and frons distinctly visible in profile as an abrupt change in curvature.

138. Levu pallescens lactinea Fennah, n. subsp. (fig. 51, *f-h*).

Head in profile strongly and evenly rounded from base of vertex to frontoclypeal suture.

Stramineous; a spot on sides of head before eyes and a suffusion on mesonotum anteriorly in line with eyes red. Female genitalia dark fuscous. Tegmina hyaline, powdered white; three faint transverse clouds in basal half of tegmina, the first across middle of clavus to costa, the second across apex of clavus to costa, the third from commissural margin distad of claval apex as far as M, and a very faint suffusion adjoining subapical cross veins, grayish fuscous; a transverse veinlet between Sc+R and costa, R and anterior branch of M just distad of their ultimate forks, fuscous piceous, veins pallid yellow, costal margin distally tinged orange brown. Wings hyaline, thinly powdered with white, veins concolorous or pallid yellow.

Male genitalia as in typical subspecies but differing slightly in shape of aedeagal flagellum and of apex of longer dorsal process of genital styles.

Holotype, male (US 62163), Koror, Palau Is., Nov. 18, 1947, Dybas. Palau: Babelthuap, 11 males and three females, east Ngatpang, 65 m., Mar., Dec. 1952, Gressitt; Ngeremeskang, 25 m., Dec. 1952, Gressitt; Koror, six males and one female, Nov. 18, 1947, Dybas; Limestone Ridge, 40 m., Dec. 1952, Gressitt; Auluptagel, 11 males, five females, and one mutilated specimen, Jan. 1948, Dybas, Sept. 1952, Krauss; northwest, 25 m., Dec. 1952, Gressitt, Jan. 1948, Dybas, Dec. 1952, Beardsley; Urukthapel, two males and two females, northeast, 190 m., Ngeremediu, Dec. 1952, Gressitt; Peleliu, two males, northeast, limestone ridge, Jan. 1948, Dybas.

DISTRIBUTION: Western Caroline Is. (Palau).

This subspecies is distinguished by the coloration of the head, mesonotum, and tegmina; by the shape of the head in profile; and by small details in the shape of the genitalia.

139. Levu pallescens haedulus Fennah, n. subsp.

Lateral margins of vertex and frons contiguous from base almost to apex. Grayish stramineous; a small spot on sides of head anterodorsad of eyes and a faint suffusion before eyes orange; mesonotum laterally, pro- and mesotarsi distally, and abdominal segments except near posterior margin fuscous. Tegmina hyaline, venation broadly overlain with fuscous; veins near apex, and apical margin pale orange brown.

Male genitalia of same form as in preceding subspecies, but genital styles with lower distal angle produced, subacute.

Holotype, male (US 62162), Truk, Wena (Moen), Mt. Tonaachau, south valley, Apr. 2, 1949, Potts. Truk: Forty-one males and 12 females. Ton (Tol): Mt. Unibot, Dec., Jan. 1953, Gressitt; Pata, Sabote-Epin, Apr. 1940, Yasumatsu and Yoshimura. Wena (Moen): South valley, Mt. Tonaachau, Apr. 2, 1949, Potts; Mt. Chukumong, north basin, on *Cyrtospermum,* Mar. 1949, Potts. Tonoas: July 1939, Esaki.

DISTRIBUTION: Eastern Caroline Is. (Truk).

This subspecies is distinguished by the strongly compressed head, by the coloration, and by the shape of the genital styles.

Family ACHILIDAE Stål

Key to Genera of Pacific Achilidae

1. Width of vertex not more than two-thirds width of pronotum.......... 2
   Width of vertex more than two-thirds width of pronotum.......... 8

2 (1). Metathoracic wings notched at Cu_2; post-tibiae with six spines; medioventral process of pygofer paired and detached from margin; pregenital sternite of female large, elongate, triangular.......... **Rhotala** Walker
   Not as above.......... 3

3 (2). Vertex with disc not depressed, anterior marginal carinae obsolete, second segment of antennae projecting laterad beyond eyes.......... **Achilus** Kirby
   Vertex with disc depressed or with three broad sublongitudinal sulci.......... 4

4 (3). Vertex five-sided with three broad sublongitudinal sulci, devoid of median carina but with two diverging submedian ridges.......... **Bunduica** Jacobi
   Vertex not as above.......... 5

5 (4). Margins of frons and clypeus not foliate, one carina at lateral margin of pronotum.......... 6
   Margins of frons and clypeus foliate, two carinae at lateral margin of pronotum.......... 7

6 (5). Basal width of vertex not twice length in middle; clypeus with frons forming a shallow curve in profile.......... **Faventia** Stål
   Basal width of vertex twice length in middle; clypeus with frons strongly convex in profile.......... **Booneta** Distant

7 (5). Vertex more than twice as broad as long, anterior margin transverse.......... **Catonidia** Uhler
   Vertex not more than twice as broad as long, anterior margin angulate at apex.......... **Aneipo** Kirkaldy

8 (1). Width of vertex measured at base of middle line at least twice length along middle, usually more, posterior margin not deeply excavate, base of frons visible from above, frons relatively broad throughout, no areolets sublaterally between vertex and frons.......... 9
   Width of vertex not twice length along middle; lateroapical areolets present or absent.......... 14

9 (8). Vertex with anterior margin broadly and evenly rounded, distinctly depressed just inside anterior margin; frons with two pale transverse bands.......... **Pyrrhyllis** Kirkaldy
   Vertex with anterior margin truncate or obtusely angulate at apex.......... 10

10 (9). Vertex about six times as broad as long in middle; tegmina with foliate elevations on M, Cu, and claval veins.......... **Tropiphlepsia** Muir
   Vertex and tegmina not as above.......... 11

11 (10). Frons with disc markedly impressed in apical third, with a transverse pallid band.......... **Aristyllis** Kirkaldy
   Frons with disc not depressed, with two pallid transverse bands or none.......... 12

12 (11). Tegmina with Sc and R together with only three veins at margin, M_{1+2} forking at apical transverse line, Cu_{1b} strongly convex before this line.......... **Plectoderoides** Matsumura
   Venation not as above.......... 13

13 (12). Frons with two pallid transverse bands.......... **Benella** Kirkaldy
   Frons devoid of such bands, pronotum very narrow behind eyes, lateral carinae not attaining hind margin, a transverse callus between frons and vertex.......... **Agandecca** White

14 (8). Vertex with median carina prominent and apical transverse carina obsolete.......... **Akotropis** Matsumura
   Vertex distinctly transversely carinate at apex.......... 15

19 (16). Median carina of vertex at base as high as lateral margins or nearly so, tegulae curved, not carinate, vertex acutely angulate at apex .... Salemina Kirkaldy

Median carina of vertex, if present, weak; disc of vertex distinctly depressed, without an impression on each side of middle line; tegulae 20

second segment subglobose. Pronotum moderately short, in middle line distinctly less than half length of vertex, disc anteriorly transverse, posteriorly obtusely angulately excavate, shallowly hollowed out between carinae, lateral discal carinae straight, reaching hind margin, about one-third longer than median carina, pronotum much constricted behind eyes, with indications of five areolets on each side, one distinct and one feeble carina on each side between eye and tegula, ventral margin of lateral lobes slightly oblique: mesonotum longer than vertex and pronotum combined, very slightly broader than long, tricarinate; tegulae moderately large; protibiae only slightly shorter than profemora, post-tibiae with a small spine laterally at basal third, seven spines at apical margin; basal metatarsal segment with seven spines apically, second metatarsal segment with six.

Tegmina three times as long as broad, costal margin slightly convex, sutural margin forming a reentrant angle of 150 degrees at apex of clavus, Sc+R fork about level with Cu_1 fork, both very slightly distad of union of claval veins, veins prominent, 10 areoles around margin of membrane distad of stigmal cell; clavus terminating distad of middle of tegmen.

Vertex testaceous with alternate black and creamy-white marking at margin; latero-apical facets fuscous, carinae pallid; frons testaceous fuscous with a broad creamy-white band across middle, twice interrupted on each side, clypeus and rostrum ivory yellow, a short transverse band across clypeus near its apex fuscous, sides of head colored correspondingly with frons and clypeus. Pronotum with carinae stramineous, disc testaceous, lightly sprinkled fuscous, darker adjoining median carina, postocular areolets fuscous; mesonotum testaceous, finely striped and dappled fuscous, a narrow transverse biconcave vitta in distal third of disc and a narrow transverse sinuate vitta near posterior third pale stramineous; tegulae testaceous with pallid margins; mesopleurites castaneous fuscous with posterior margin ivory; fore and middle legs broadly banded alternately fuscous and pale stramineous, hind legs stramineous, fuscous at apex of femora, base and apex of tibiae, and base of tarsi. Tegmina translucent grayish testaceous; base of corium, clavus, and a broad band from Cu_1 fork to stigma fuscous; veins testaceous; four distinct spots on costal margin and a series of peglike outgrowths from each vein into corium and membrane creamy white to pale stramineous; wings lightly infuscate with brown veins.

Anal segment of male in dorsal view short and broad, lateral margins convex, apical margin angulately excavate. Pygofer produced caudad at middle of ventral posterior margin in a pair of narrow lobes which are broader distally than at base, these lobes separated by a deep narrow cleft extending basad along middle line. Aedeagus comprising a pair of phallic appendages, long, ribbonlike and not quite of equal length, and a bilaterally symmetrical phallobase in which the lateroventral margins bear about 20 minute teeth in their basal half, the laterodorsal six on each side in the distal half. Genital styles broadly subovate with two acuminate eminences on dorsal margin, the more basal directed laterocephalad and the other dorsad.

Male: length 3.0 mm., tegmen 3.6 mm.

Holotype, male (US 62186), Ulimang, Babelthuap, Palau Is. Dec. 5, 1947, Dybas. One female, Ngeremeskang, Babelthuap, Dec. 20, 1952, Gressitt.

DISTRIBUTION: Western Caroline Is. (Palau).

In my key to Pacific genera (1950, B. P. Bishop Mus., Bull. 202: 74) this species runs to couplet 23, but differs from *Callinesia* in color pattern, and shape of head and pronotum and from *Phenelia* in the granulate tegminal veins. In my world key [1950, Bull. British Mus. (Nat. Hist.), Ent. **1** (1) : 47] it runs to couplet 113 where neither condition is satisfactorily fulfilled. If each set of possibilities is investigated from this point it runs to *Nephelia, Argeleusa,* or *Cnidus*. It differs from *Cnidus* in the shape of the basal part of the frons and in the much shorter postocular part of the pronotum. It does not agree with *Argeleusa* in the shape of the areolets at the apex of the vertex or in

its straight outline in profile. It differs from *Nephelia* in tegminal characters. As is evident from examples in the genus *Catonia*, the presence of a pair of white bands across the frons and clypeus is not of generic significance. If this character is so used, however, the specimen will run to *Benella* in Kirkaldy's key [1907 Hawaiian Sugar Planters' Assoc. Exper. Sta., Ent. Bull. **3** (1): 115], but it differs from *Benella* in the granulate tegmina.

To judge by the genus *Opsiplanon* the pattern of four transverse curved stripes on the mesonotum is of generic value. *Argeleusa* has such a pattern, as well as granulate tegmina and banded fore and middle legs. As the available material is so limited, I consider it best to assign the species to *Argeleusa* on the provisional assumption that the genus, like *Catonia*, contains a complex of forms which display a certain amount of plasticity in the shape of the anterior part of the head and in that of the pronotal disc.

Allowance has been made for this assumption in the slightly modified key presented above.

FAMILY DICTYOPHARIDAE SPINOLA

Genus **Chanithus** Kolenati

Chanithus Kolenati, 1857, Soc. Nat. Moscou, Bull. **30**: 427 [haplotype: *Flata pannonica* Germar, 1830, Thon's Ent. Archiv. 2 (2): 47].

141. Chanithus gramineus (Fabricius). (Figure 52, *f*.)

Fulgora graminea Fabricius, 1803, Syst. Rhyngotorum, 4.

Post-tibiae laterally four- or five-spined, apically seven-spined. Aedeagus consisting of a membranous sac which, when inflated, is distended in two pairs of blunt lobes, the lower pair with two straight slender spines at the apex of each, the upper pair with four similar spines at the apex of each, the upper spines rather longer than the lower.

DISTRIBUTION: Turkey, Caucasus, Iraq, India, East Indies, China, Philippines, southern Mariana Is., western Caroline Is.

S. MARIANA IS. SAIPAN: Two females, Aug. 1951, Bohart; Tanapag, Jan. 1949, on breadfruit, Maehler. TINIAN: One female, Dec. 1952, Beardsley. GUAM, 51 males and 57 females: Northwest Airfield, Aug. 1952, Krauss; Potts Junction, Oct. 1952, Krauss; Mt. Santa Rosa, May, June 1945, on bamboo leaves, Bohart and Gressitt; Pt. Oca, June, Dec. 1945, Bohart and Gressitt, May 1945, Dybas, Sept. 1951, R. M. Bohart; Yigo, Dec. 1947, Maehler, on sunflower, Sept. 1938, Oakley, Jan.-Apr. 1945, Baker; Barrigada, Aug. 1945, Wallace; near Harmon Field, Jan. 1949, Maehler; Agana, on *Hibiscus*, Dec. 1947, Maehler, Oct. 1952, Krauss, June 1945, Wallace; Fadang, June 1945, Dybas; Fonte River, Aug. 1945, Wallace; 1 mile south of Asan, 180-240 m., Oct. 1947, Dybas; Mt. Alutom, June 1946, Townes; Orote Peninsula on *Sida*, Sept. 1936, Swezey; Yona, Oct. 1952, Krauss; Talofofo, Dec. 1947, Maehler, Dec. 1948, Aug. 1952, Krauss; Mt. Lamlam, 400 m., Nov. 1952, Gressitt;

Ovipositor with first valvulae asymmetrical at base, that of left side produced in a short broad truncate lobe, that of right in a broad crescentic lobe twice as long as that on left.

Male: length 5.2 mm., tegmen 6.8 mm.; *female:* length 6.0 mm., tegmen 7.0 mm.

Holotype, male (US 62178), Mt. Beirut, Ponape, June-Sept. 1950, Adams. Truk: Ton (Tol); one male, Mt. Unibot, 390 m., Feb. 1953, Gressitt. Ponape, 11 males and 24 females, one mutilated specimen, and one nymph: Mt. Beirut,

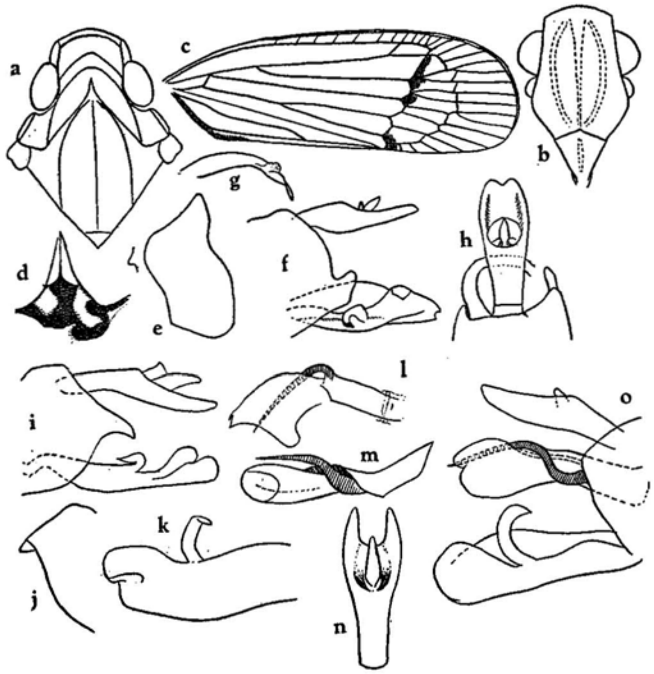


FIGURE 53.—**a-h,** *Leptovanua serapis: a,* head and thorax; *b,* frons and clypeus; *c,* tegmen; *d,* base of ovipositor, ventral view; *e,* pygofer, right side, incurved lateral process shown separately; *f,* anal segment, pygofer (left side), and genital style; *g,* aedeagus; *h,* anal segment, dorsal view. **i-n,** *L. telamon telamon: i,* anal segment, pygofer and genital style; *j,* lateral margin of pygofer, right side; *k,* genital style, ventrolateral view; *l,* aedeagus, lateral view; *m,* aedeagus, dorsal view; *n,* anal segment, dorsal view. **o,** *L. t. palauana,* male genitalia.

660 m., July 1950, Adams, Mar. 1948, Dybas; Tolotom, 630 m.; Tolenot, 200 m., Mt. Nanalaud and Not [Net] Pt., all June-Sept. 1950, Adams; Colonia, near sea level, Feb. 1948; Mt. Kupuriso, 600 m., Mar. 1948, Dybas; Mt. Temwetemwensekir, 150-300 m., Feb. 1948; 180 m., Jan. 1953, Gressitt; Nanpil, Nett District, Mar. 1938, Esaki; One-Nipit, July 1939; Paliker-Colonia, Jan. 1938, Esaki.

DISTRIBUTION: Eastern Caroline Is. (Ponape, Truk).

This species differs from *L. pallida* Melichar and *L. obiensis* Melichar in the carinate vertex and subcostal venation and differs from *L. suturalis* Melichar in color pattern. In the shape of the frontal carinae it is rather like *Leptovanua simplex* (Walker), new combination; but the sublateral carinae are more nearly parallel in their basal half, whereas the lateral margins are rather more concave in their basal two-thirds. From *L. straminea* (Distant) it differs in the shape of the frontal carinae and in the absence of dendroid ornamentation between the tegminal veins.

143. Leptovanua telamon telamon Fennah, n. sp. (fig. 53, *i-n*).

Vertex broader than long in middle line (about 2.4:1), not medially carinate. Frons very weakly convex transversely, in profile more distinctly convex, sublateral carinae widest apart at base, converging distally throughout. Tegmina with costal area, at level of middle of tegmen, a little broader than costal cell, about 15 oblique transverse veinlets between costa and margin as far as node.

Pale green; anterior margin of vertex tinged orange. Tegmina and wings hyaline with green veins.

Anal segment of male moderately large, asymmetrical, lateral margins convex, apical margin deeply excavate in U-shape; in profile right ventral margin very shallowly convex, left ventral margin more deeply so. Pygofer not bilaterally symmetrical; right lateral margin near its upper end produced caudad and mesad in a short rounded-triangular lobe which is bent ventrad distally, left side at same level produced caudad in a broad oblique quadrate lobe. Aedeagus sclerotized and broadly tubular in basal half, with upper distal margin produced caudoventrad in a long stout spinose process which is strongly curved at base then straight for most of its length; apical half of aedeagus broadly subtriangular, more or less membranous. Genital styles fused, elongate-ovate, a long stout curved bluntly spinose process on left side at middle; dorsal margin distad of this produced in a broad triangular lobe, inflected mesad, but not further sclerotized or pigmented; apical margin shallowly notched.

Ovipositor with first valvulae almost perfectly symmetrical at base, weakly produced in a small rounded-triangulate lobe, that of left side slightly more acute than that of right.

Male: length 5.9 mm., tegmen 7.2 mm.; *female:* length 7.7 mm., tegmen 9.0 mm.

Holotype, male and allotype, female (US 62179), Dugor, Yap, July-Aug. 1950, Goss. Yap: Eighteen males, 15 females, one mutilated specimen, and one nymph, Sept., Oct. 1952, Krauss; Ruul District, July-Aug. 1950, Goss; central Yap, July-Aug. 1950, Goss, July 1951, Gressitt; Kolonia, July-Aug. 1950, Goss; hill behind Yaptown, 50 m., Dec. 1952, Gressitt; Mt. Matade, 95 m., Dec. 1952, Gressitt; Dugor, 10 m., Nov. 1952, Gressitt. Rumung: Sept. 1939, Esaki. Map: south and west, July-Aug. 1950, Goss.

DISTRIBUTION: Western Caroline Is. (Yap).

This species is distinguished from *L. serapis* by the relatively longer vertex and flatter frons, by the shape of the sublateral frontal carinae and by the broader costal area in the tegmina. The genitalia in both sexes differ very markedly from those of *L. serapis*. The differences in tegminal coloring in the male are constant.

144. Leptovanua telamon palauana Fennah, n. subsp. (fig. 53, *o*).

Similar to typical subspecies in coloration and external structure.

Anal segment of male as in typical subspecies. Pygofer with almost entire left margin produced, weakly incurved in upper half, right margin shallowly convex with a slight indentation in upper half. Aedeagus tubular and pigmented in basal third, the lower apical margin produced in a long pigmented spinose process which curves upward from right at base to middle, then descends to left: below this process and broadly attached to tubular basal portion a spatulate membranous lobe almost as long as the spinose process. Genital styles fused, of approximately same shape as in typical subspecies.

Ovipositor with first valvulae symmetrical with lobes at base small, rounded-auriculate.

Male: length 7.0 mm., tegmen 8.2 mm.; *female:* length 8.6 mm., tegmen 9.2 mm.

Holotype, male (US 62180), Koror, Palau Is., Mar. 15-25, 1948, Maehler. Kayangel: Two females, Ngajangel, Dec. 1952, Gressitt. Babelthuap: Nine males and nine females, Ulimang, Dec. 1947, Dybas; Ngarhelong, Dec. 1947, Dybas; Ngatpang, 65 m., Dec. 1952; Ngeremeskang, 25 m., Dec. 1952; Iwang, 8 m., Dec. 1952, Gressitt. Malakal: One female, Sept. 1952, Krauss. Koror: Thirteen males and 12 females, 12 m., Limestone Ridge south of inlet, Jan. 1948; Nov. 1947, Dybas; Mar. 15-25, 1948, Maehler; Dec. 1952, Gressitt; Sept. 1952, Krauss; Apr.-May 1949, Langford, Feb. 1936, Esaki, and Sept., Dec. 1952, Beardsley. Auluptagel: Two females and one mutilated specimen, Jan. 1948, Dybas, Sept. 1952, Krauss. Peleliu: Two females, east coast, Jan. 1948, Dybas; Akarokuru-Garudoroko, Aug. 1939, Esaki.

DISTRIBUTION: Western Caroline Is. (Palau).

This subspecies is distinguished from the typical subspecies by its size and by the characters of the pygofer and aedeagus.

Genus **Tambinia** Stål

Tambinia Stål, 1859, Berliner Ent. Zeitschr. **3**: 316 (logotype, *Tambinia languida* Stål, op. cit., p. 317).

Post-tibiae with two spines laterally and three apically, basal metatarsal segment with four spines, second metatarsal with two.

145. Tambinia guamensis Metcalf (fig. 54, *a, d, g*).

Tambinia guamensis Metcalf, 1946, B. P. Bishop Mus., Bull. **189**: 118.

Vertex in middle line longer than broad across base (1.3:1). Tegmina 3.1 times as long as broad. Aedeagus simple, straight, tubular, porrect caudad.

DISTRIBUTION: Southern Mariana Is.

S. MARIANA IS. SAIPAN: One male and five females, Matansha-Calabera, May 1940, Donni-Sadog Tasi, May 1940, and Garapan, May 1940, Yasumatsu and Yoshimura; Halaihai-As Teo area, Jan., Feb. 1945, Dybas. GUAM: Four males and eight females, Pt. Oca, May 1945, Mt. Santa Rosa, May 1945, Pago, May 1945, and Pilgo River, May 1945, all by G. Bohart and Gressitt; Mt. Alutom, June 1946, Townes; Yigo, Aug. 1952, Krauss; Mt. Balanos, Aug. 1952, Krauss; Fadang, May 1945, Dybas.

146. Tambinia sisyphus Fennah, n. sp. (fig. 54, *e, f, i*).

Vertex in middle line longer than broad across base (1.7:1). Tegmina 3.3 times as long as broad, apical margin rather deeply rounded. Pale green; eyes red, tibial and tarsal spines black.

Anal segment very short, anal style ovate, much projecting. Pygofer with laterodorsal angles rectangulate, lateral margins oblique, straight; medioventral process absent. Aedeagus tubular, straight, porrect caudad, a small triangular lobe projecting on left near apex. Genital styles moderately long, of equal width throughout, slightly curved upward distad, a small lobe at apex directed mesad; a strongly curved pointed process near middle of dorsal margin.

Male: length 4.8 mm., tegmen 4.0 mm.; *female:* length 5.1 mm., tegmen 5.0 mm.

Holotype, male (US 62181), Ulimang, Babelthuap, Dec. 22, 1947, Dybas. Babelthuap: Four males and two females, Ulimang, Dec. 22, 1947, Dybas; southwest of Ulimang, Dec. 1947, Dybas; Ngatpang, 65 m., Dec. 1952, Gres-

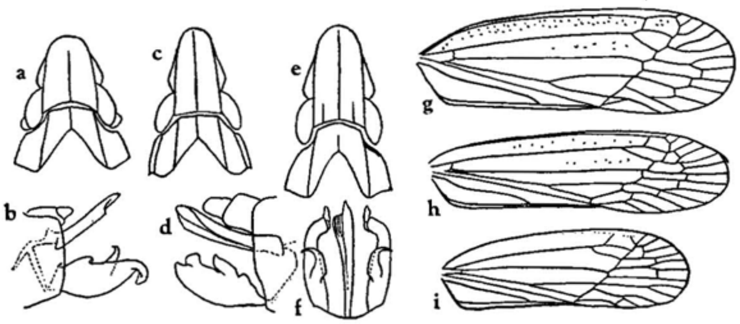


FIGURE 54.—**a, d, g,** *Tambinia guamensis: a,* vertex and pronotum; *d,* male genitalia, right side; *g,* tegmen. **b, c, h,** *T. baucis: b,* aedeagus; *c,* vertex and pronotum; *h,* tegmen. **e, f, i,** *T. sisyphus: e,* vertex and pronotum; *f,* aedeagus and genital style, ventral view; *i,* tegmen.

sitt; Ngarumisukan-Kaishar, Aug. 1939, Esaki. Koror: Two males and one female, Arumizu, Jan. 1938, Esaki, Mar. 1954, Beardsley. Ngarmalk (NW. Auluptagel): One female, Sept. 1952, Krauss.

DISTRIBUTION: Western Caroline Is. (Palau).

This species is distinguished by the shape of the head, by the shape of the aedeagus, and by the proportions of the tegmina. In the first character it resembles *T. verticalis* Distant but differs entirely in the shape of the tegmina.

147. Tambinia baucis Fennah, n. sp. (fig. 54, *b, c, h*).

Vertex in middle line longer than broad across base (1.7:1). Tegmina 3.7 times as long as broad, apical margin very deeply rounded.

Pale green; eyes red, tibial and tarsal spines black. Tegmina pale green; a small spot near node and another at apex of clavus piceous.

Anal segment of male short, anal style projecting caudad. Pygofer with laterodorsal angles rounded, lateral margins straight, a little oblique. Aedeagus tubular, straight, transversely bifid near apex into two unequal limbs, the dorsal more than twice as long as the ventral. Genital styles of same general form as those of *T. guamensis* but curved spinose processes on dorsal margin distinctly shorter.

Male: length 3.5 mm., tegmen 3.5 mm.; *female:* length 5.0 mm., tegmen 4.9 mm.

Holotype, male (US 62182), central Yap I., July 8, 1951, Gressitt. Four males and two females, central Yap I., July 8, 1951, Gressitt, Oct. 1952, Krauss; hill behind Yaptown, Nov. 1952, Gressitt.

DISTRIBUTION: Western Caroline Is. (Yap).

This species is distinguished by the proportions of the vertex and tegmina and by the shape of the male genitalia. It is superficially like *T. sisyphus,* but the shape of the aedeagus appears to be too different to permit the recognition of the Yap form as a subspecies of *T. sisyphus.*

Genus **Swezeyaria** Metcalf

Swezeyaria Metcalf, 1946, B. P. Bishop Mus., Bull **189**: 116 (orthotype: *Swezeyaria viridana* Metcalf., op. cit., p. 117).

Post-tibiae laterally trispinose, apically six-toothed; basal metatarsal segment apically

148. **Swezeyaria viridana viridana** Metcalf.

Swezeyaria viridana Metcalf, 1946, B. P. Bishop Mus., Bull. **189**: 117.

DISTRIBUTION: Southern Mariana Is.

S. MARIANA IS. GUAM: One male and one female, Pt. Ritidian, June 1945, G. Bohart and Gressitt; Sinajana, Aug. 1945, Wallace.

149. **Swezeyaria viridana unicolor** Metcalf (fig. 55, *a-d*).

Swezeyaria unicolor Metcalf, 1954, Elisha Mitchell Sci. Soc., Jour. **70** (1): 13.

Tegmina with Sc+R fork only very slightly distad of Cu_1 fork.

Pale greenish yellow, probably green in life, a dark stripe before eyes; median carina of frons yellowish brown, sometimes red. Female sometimes striped longitudinally with red between carinae of vertex, pronotum, and mesonotum. Tegmina translucent, tinged pale green; a suffusion in first subapical cell of Cu_1, and a much smaller suffusion at base of subapical cell M_{3+4} dark brown; veins green, becoming fuscous distad of subapical line of transverse veinlets, membrane in this area very faintly tinged fuscous. Wings hyaline, veins brown; sometimes a spot at node and a suffusion along nodal line distally, fuscous.

Anal segment of male rather long, tubular in basal third, flattened and spatulate in distal two-thirds, apical margin short and deeply excavate, apical angles acute with edges sclerotized in a minutely comblike process. Pygofer with laterodorsal angles rounded-obtuse, lateral margins straight, slightly oblique. Aedeagus long, tubular, acute at apex, directed caudad. Genital styles fused together into an asymmetrical U-shaped plate with its left side very shallow, deeply cleft distally; apical margin on right side broadly rounded, apical margin on left side broadly ribbonlike, curved dorsad and to right; at base of median cleft a pair of very small acute sclerotized lobes; on left side, two-thirds from base, a long curved subspinose process directed dorsad and curved anteriorly and then ventrad at its apex.

Male: length 4.8 mm., tegmen 5.0 mm.; *female:* length 5.6 mm., tegmen 6.0 mm.

Holotype, male (US 62183), Mt. Kupuriso, Ponape, Caroline Is., Mar. 11, 1948, Dybas. Ponape: Twenty-four males, 30 females, one mutilated specimen, and one nymph, Matalanim Plantation, June-Sept. 1950, Adams, Dec. 1948, Maehler, Nov. 1949, Langford; Mt. Kupuriso, north slope, 300-450 m., Mar. 11, 1948, Dybas; Nanpil, Nett District, Feb. 1948, Dybas;

Colonia, near sea level, Mar. 1948, Dybas; Colonia-Sankakuyama, July 1939, Esaki; Colonia-Paliker, July 1939, Esaki; Colonia-Nampir, Jan. 1938, Esaki; Mt. Temwetemwensekir, 150-450 m., Feb. 1948, Dybas; 180 m., Jan. 1953, Gressitt, Dec. 1948, Maehler; Tolenkiup, Jan. 1950, Adams; Ronkiti-One, July 1939, One-Nipit, July 1939, both by Esaki.

DISTRIBUTION: Eastern Caroline Is. (Ponape).

The series from Colonia includes the most contrasted color forms, so that it is evident that the coloring is without topographical significance. This subspecies is most readily distinguished from *S. viridana viridana* by the proportions of the subapical cells. The tegmina are, in fact, relatively narrower

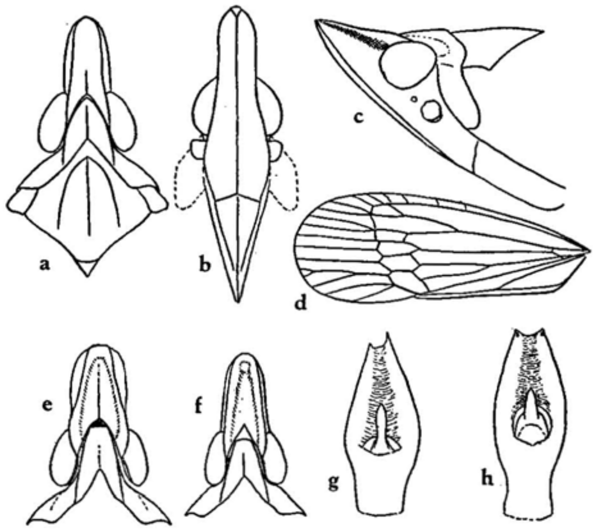


FIGURE 55.—**a-d,** *Swezeyaria viridana unicolor: a,* head and thorax; *b,* frons and clypeus; *c,* head in profile; *d,* tegmen. **e, h,** *S. v. orientalis: e,* head and pronotum; *h,* anal segment of male. **f, g,** *S. v. constricta: f,* head and pronotum; *g,* anal segment of male.

throughout. In profile the upper margin of the head is almost straight in *S. viridana unicolor,* whereas it is distinctly concave and ascending in the typical subspecies.

150. Swezeyaria viridana constricta Fennah, n. subsp. (figs. 55, *f, g;* 56, *g*).

Closely similar to *S. viridana unicolor* in all structures, but with a relatively longer frons and vertex and with the lateral margins of the frons not sinuate near base in lateral view. Tegmina are relatively longer than in the typical subspecies, whereas the post-tibiae are both longer and more slender than in either of the other subspecies. The material is pale stramineous, but probably pale green in life.

Holotype, male (US 62184), Nama I., Dec. 18, 1950, Langford; paratype, female, Epinup, Moen, Truk, Mar. 26, 1949, Potts.

CAROLINE ATOLLS. NAMA: Thirteen males and 15 females, Dec. 18,

Type: *Nesotemora cinyras,* new species.

This genus is near *Swezeyaria,* notwithstanding the differently shaped head. It differs in the proportions of the mesonotum, which is relatively broader than in *Swezeyaria;* in the relatively shorter lateral margins of the pronotum; in the relatively longer rostrum; in the position of the union of the claval veins; and in the angle of curvature of the posterior claval vein near its base. In Melichar's key to Paricanini this genus runs to *Stacota* Distant, from which it differs in tegminal shape and venation, and in his key to Tambiniini it runs to couplet (22) but no farther.

153. **Nesotemora cinyras** Fennah, n. sp. (fig. 57, *a-e*).

Vertex in middle line shorter than width between eyes (1:2.1), median carina feebly present in basal half, a very short obliquely linear elevation submedially from posterior margin; frons in middle line longer than broad (1.5:1).

Grayish stramineous; a narrow stripe on each side of median carina of clypeus, a few small suffusions on pleurites, stripes along all femora, abdominal tergites laterally, and

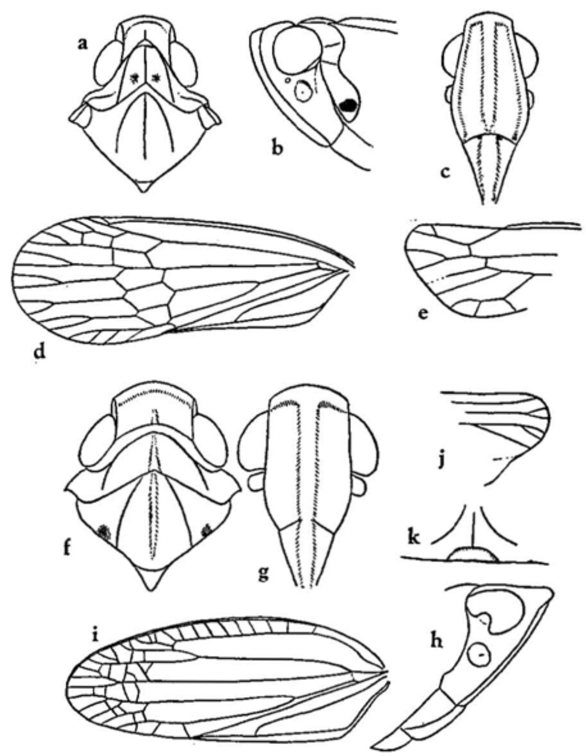


FIGURE 57.—**a-e,** *Nesotemora cinyras: a,* head and thorax; *b,* head in profile; *c,* frons and clypeus; *d,* tegmen; *e,* wing. **f-k,** *Mesepora issiformis: f,* head and thorax; *g,* frons and clypeus; *h,* head in profile; *i,* tegmen; *j,* sketch of apical part of wing; *k,* base of ovipositor, ventral view.

anal segment of female, fuscous; an ovate spot near ventral margin of each lateral pronotal lobe piceous. Tegmina hyaline with faint stramineous suffusion, a small spot at node fuscous piceous; veins yellowish, dark brown distad of nodal line. Wings hyaline with brown veins, with a dark fuscous suffusion in anal area.

Anal segment of female very short.

Ovipositor with a triangular-conical eminence, with apex directed caudad, at base of first valvulae. Third valvulae with five recurved and flattened teeth at apex, four of them in close array and one behind, lower margin of valvulae with eight short stout triangular teeth.

Female: length 4.8 mm., tegmen 6.6 mm.

Holotype, female (US 62177), Gagil District, Yap, July-Aug. 1950, Goss. Yap: One female, Gagil District, July-Aug. 1950, Goss. Palau: One female, Ngeremeskang, Babelthuap, 30 m., Dec. 1952, Gressitt.

DISTRIBUTION: Western Caroline Is.

Genus **Kallitaxila** Kirkaldy

Kallitaxila Kirkaldy, 1901, Entomologist **34**: 6 (orthotype: *Kallitaxila granulata* Stål, 1870, Öfv. K. Vet.-Akad., Förh. **27**: 750).

Post-tibiae laterally with two spines, apically five-spined, two of these being close together, basal metatarsal segment distally five-spined.

154. **Kallitaxila suturalis** (Matsumura).

Taxila suturalis Matsumura, 1914, Mus. Nat. Hungarici, Ann. **12** (1): 265.

DISTRIBUTION: Bonin Is., six males, six females, and one nymph.

BONIN IS. CHICHI JIMA: Sakai-Ura, July 1949, Mead and Kondo; Chichi Jima, July 1951, Bohart; Miyanohama, July 1949, Mead and Kondo. HAHA JIMA: 1931, Motoike and Ise; Kitamura, July 1933, Esaki, June-July 1949, Mead.

Genus **Mesepora** Matsumura

Mesepora Matsumura, 1914, Mus. Nat. Hungarici, Ann. **12** (1): 261 (orthotype: *Mesepora onukii* Matsumura, op. cit., p. 262).

Post-tibiae laterally three-spined, apically seven-spined, basal metatarsal segment seven-spined.

155. **Mesepora issiformis** Matsumura (fig. 57, *f-k*).

Mesepora issiformis Matsumura, 1914, Mus. Nat. Hungarici, Ann. **12** (1): 263.

DISTRIBUTION: Bonin Is.

BONIN IS. MUKO JIMA: One female, Muko I., July 17, 1951, R. Bohart.

156. **Mesepora boninensis** Matsumura.

Mesepora boninensis Matsumura, 1914, Mus. Nat. Hungarici, Ann. **12** (1): 263.

DISTRIBUTION: Bonin Is.

BONIN IS. HAHA JIMA: Two females, 1931, Motoike and Ise.

157. Mesepora ogasawarana Matsumura.

Mesepora ogasawarana Matsumura, 1914, Mus. Nat. Hungarici, Ann. **12** (1): 263.

DISTRIBUTION: Bonin Is., two males and two females.

BONIN IS. CHICHI JIMA: Ani Jima, north end, July 1949, Mead and Kondo, Omura Yama, Chichi Jima, July 1949, Mead and Kondo. HAHA JIMA: June-July 1949, Mead.

It is unfortunate that no precise localities are cited for Matsumura's three species from the Bonin Islands. There is little evidence to show that the three concepts are specifically distinct.

Melichar has doubtfully transferred *M. boninensis* to *Paricana,* but it is probable that he overestimated the significance of Matsumura's footnote on this species. There is no evidence that *Paricana* occurs in Micronesia.

FAMILY ISSIDAE SPINOLA

KEY TO GENERA OF PACIFIC ISSIDAE

1. Tegmina usually strongly convex, thickened, smooth, with venation obscure and clavus not marked off from corium by a suture.... **Hemisphaerius** Schaum
   Tegmina not as above, with clavus separated from corium by a suture.............. 2

2 (1). Frons as broad as long, Sc uniting with R to form a loop.......... **Sarima** Melichar
   Frons longer than broad, venation not as above.............. 3

3 (2). Clavus in profile sellate, distally vertical, not tapering until very near apex .... **Scalabis** Stål
   Clavus in profile not sellate, sometimes elevated near base, tapering evenly distally 4

4 (3). Tegmina twice as long as broad, vertex angulately produced at middle of anterior margin.............. **Lollius** Stål
   Tegmina much less than twice as long as broad.............. 5

5 (4). Vertex broader than long, frons transversely convex, margins not raised, strongly tricarinate.............. **Issarius** Metcalf
   Vertex square, frons flat or transversely triconcave.............. **Atylana** Melichar

Genus **Issarius** Metcalf

Issarius Metcalf, 1950, B. P. Bishop Mus., Occ. Papers **20** (5): 67 (orthotype: *Issarius carolinensis* Metcalf, loc. cit., p. 68).

158. Issarius carolinensis Metcalf.

Issarius carolinensis Metcalf, 1950, B. P. Bishop Mus., Occ. Papers **20** (5): 68.

DISTRIBUTION: Caroline Is. (Truk).

TRUK. Five males and four females. TON (Tol): Mt. Unibot, 390 m., Jan. 1953. FEFAN: Mt. Iron, 100 m., Jan. 1953, Gressitt. WENA (Moen): Epinup, Mar. 1949, Mt. Teroken (north), Dec. 1952, Gressitt.

159. Issarius carolinensis nassa Fennah, n. subsp. (fig. 58, *a-d*).

Vertex twice as broad as long in middle line, anterior margin straight, posterior margin shallowly angulately excavate, frons longer than broad (about 1.3 : 1), sloping anteriorly distad, abruptly recurved to frontoclypeal suture so that frons at apex distinctly overhangs base of clypeus; tricarinate, with median carina more prominent than sublateral carinae, lateral carinae of frons not reaching to clypeus, curving inward to median line just before apex.

Light fuscous, heavily mottled testaceous, with green suffusion on head, thorax, and tegmina.

Pygofer with dorsolateral angles rounded, not produced, lateral margins very slightly sinuate. Anal segment of male very short, not more than twice as long as anal style, lower lateral margin produced ventrad at middle in a rounded-triangular lobe, apical margin convex-truncate. Aedeagus in side view U-shaped, a slender spinose process on each side at middle sinuately directed dorsocaudad; three pairs of long spinose processes directed



FIGURE 58.—**a-d,** *Issarius carolinensis nassa: a,* head in profile; *b,* vertex and pronotum; *c,* frons and clypeus; *d,* aedeagus. **e-h,** *I. surenas: e,* vertex and pronotum; *f,* frons and clypeus; *g,* head in profile; *h,* aedeagus. **i-n,** *I. doricha: i,* head in profile; *j,* vertex and pronotum; *k,* frons and clypeus; *l,* aedeagus; *m,* anal segment of male; *n,* genital style.

piceous on corium between M and claval suture, dendroid outgrowths from veins pallid, occasionally forming a large spot between humeral callus and claval suture.

Aedeagus U-shaped, produced dorsad on each side at base in a large sinuate lobe infolded to form a subhorizontal ledge near its middle; at apex of aedeagus a median slender spine; distad of this spine, on each side, four pairs of spinose processes, the outer pair shortest and united basally with a long sinuate subvertical process situated laterally at middle of aedeagus, directed dorsad and acuminate at tip; the second pair of processes slightly mesad of outer pair, delicate, thin and slender, acuminate, only slightly longer than outer pair; mesad and cephalad of this a longer pair of processes directed dorsad and very slightly curved cephalad; posterior to these, and slightly mesad, a pair of long stout spinose processes directed dorsad then abruptly curved mesad near apex.

Male: length 3.9 mm., tegmen 3.9 mm.; *female:* length 6.0 mm., tegmen 6.0 mm.

Holotype, male and allotype, female (US 62193), Mt. Tafeayat, Kusaie, Aug. 20, 1946, Townes. Kusaie: Twenty-two males and 17 females, Mt. Tafe-

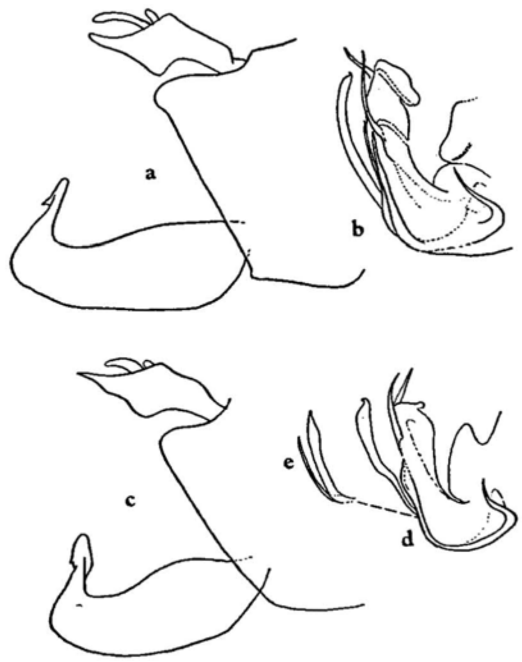


FIGURE 59.—a, b, *Issarius troilus: a,* anal segment, pygofer, and genital style, right side; *b,* aedeagus, right side. c-e, *I. tartarus: c,* anal segment, pygofer, and genital style; *d,* aedeagus, right side; *e,* posterolateral view of outer pair of ventrolateral spines of right side.

ayat, Aug. 20, 1946, Townes; 600 m., Mt. Fenkol, Jan. 1953, Gressitt; Mt. Matante, 300 m., Feb. 1953, 580 m., Feb., Mar. 1953, Clarke; "Hill 1010," Feb. 1953, "Hill 541," 165 m., Mar. 1953, and "Hill 750," 230 m., Feb. 1953, Clarke; Tafunsak, 1 m., Dec. 1952, Clarke; Mutunlik, 20 m., Mar. 1953, Clarke; Lele I., Mar. 1953, Clarke; Malem River, 90 m., Apr. 1953, Clarke.

DISTRIBUTION: Eastern Caroline Is. (Kusaie).

This species is distinguished by the relative lengths of the distal processes of the aedeagus.

163. Issarius tartarus Fennah, n. sp. (fig. 59, *c-e*).

Pallid stramineous, almost ivory yellow, minutely sprinkled with brown on head, legs, and portions of tegmina, and with piceous in middle of clypeus.

Aedeagus U-shaped, produced dorsad on each side at base in a large lobe deeply concavely excavate on its dorsal margin; at apex of aedeagus a rather stout median spine; distad of this spine, on each side, four pairs of spinose processes, the outer pair broad, ensiform, closely adpressed to side of aedeagus, rather abruptly narrowing to acute apex, basally united with a short S-shaped subvertical process situated laterally at middle of aedeagus, directed dorsad and acuminate at tip; the second pair of processes mesad of and shorter than the outer pair, slender, pellucid, and acuminate, normally completely concealed by outer pair; mesad and cephalad of this a pair of longer processes evenly curved cephalad distally; posterior to these, and slightly mesad, a pair of long stout spinose processes, distally slightly swollen, directed dorsad then abruptly curved mesad near apex, the short horizontal portion sinuately twisted.

Male: length 5.2 mm., tegmen 4.0 mm.; *female:* length 6.8 mm., tegmen 4.8 mm.

Holotype (US 62192) and one male and one female, Rugi, Rota, June 29, 1946, Oakley.

DISTRIBUTION: Southern Mariana Is. (Rota).

This subspecies is distinguished by the shape of the aedeagal processes, of which the broad outer pair and small concealed inner pair are the most striking.

164. Issarius nestor Fennah, n. sp. (fig. 60, *a-d*).

Testaceous, mottled fuscous; laterodistal angles of frons and disc of clypeus piceous, second antennal segment and postfemora dark fuscous. Tegmina subtranslucent, testaceous, veins stramineous, tinged brown.

Aedeagus U-shaped, produced dorsad on each side at base in a large lobe with a small flaplike appendage at its base and a sclerotized strut directed ventromesad on its inner face; at apex of aedeagus a sinuate, rather slender median spine; distad of this spine, on each side, three pairs of spinose processes, the most basad of these forming an ovate knob at base, then sloping sinuately caudad and finally slightly curved upward distally; second pair of processes L-shaped, broad in lower limb, straight and narrow distally, curved cephalad apically; third pair directed dorsad, curved cephalad at tip.

Male: length 4.3 mm., tegmen 5.3 mm.

Holotype, male (US 62194), Ngerkabesang (Arakabesan) I., Palau Is., July 18, 1946, Townes.

DISTRIBUTION: Western Caroline Is. (Palau).

This species is distinguished by the shape of the male genitalia.

165. Issarius panope Fennah, n. sp. (fig. 60, *g, h*).

Vertex along anterior margin broader than long in middle (1.7:1), posterior margin weakly angulately excavate; frons in middle line longer than broad (1.5:1), moderately sloping anteriorly distad, in profile abruptly recurved at apex to frontoclypeal suture, so that frons slightly overhangs base of clypeus; lateral carinae of frons not quite reaching to base of clypeus, curving in to median line just before apex, median carina only very slightly more prominent than lateral carinae.

Pale fuscous, so heavily mottled testaceous as to appear generally of this hue, disc of clypeus dark fuscous; legs sometimes suffused with green. Tegmina translucent testaceous; a dumbbell-shaped patch between humeral callus and Cu_1 greenish white, apical cells with irregular brown marks; apical veins and submarginal vein suffused with green.

Pygofer with dorsolateral angles rounded, not produced, lateral margins very weakly sinuate. Anal segment of male very short, not more than twice as long as anal style, lower lateral margin in profile almost straight, apical margin distinctly convex. Aedeagus in side view U-shaped, a moderately long and broad bladelike spine in basal third directed dorsocephalad; on dorsal margin near middle a very broad rounded-triangular lobe; a little distad of this, on dorsal margin, a pair of moderately broad, straight membranous

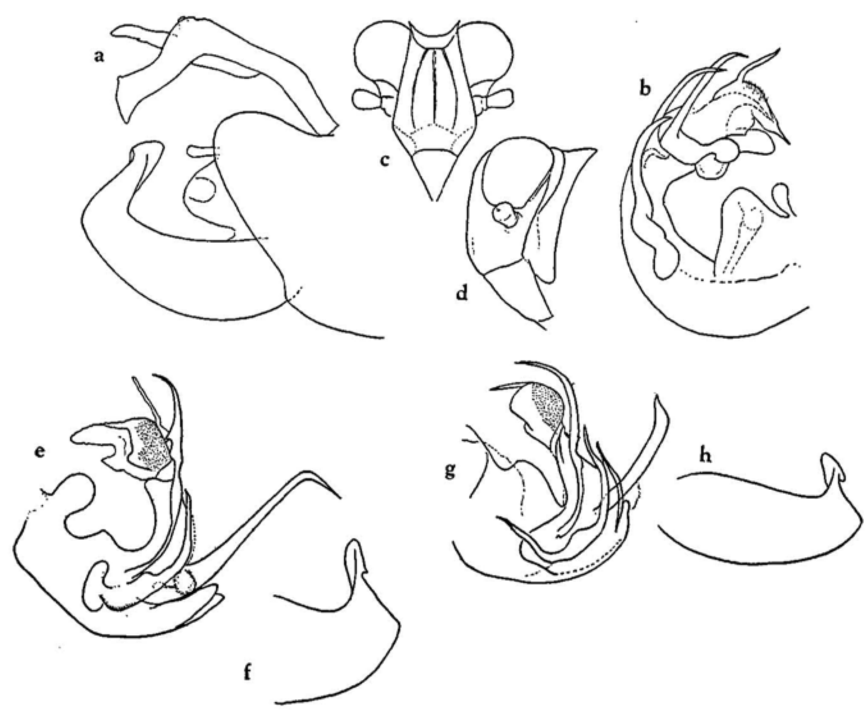


FIGURE 60.—**a-d,** *Issarius nestor: a,* male genitalia, right side; *b,* aedeagus, right side; *c,* frons and clypeus; *d,* head in profile. **e, f,** *I. iole: e,* aedeagus; *f,* apical part of genital style. **g, h,** *I. panope: g,* aedeagus; *h,* genital style.

lobes, with a median rounded hoodlike lobe between them distally, bearing in its middle line a slender curved spine directed cephalad; closely adjoining these distally a pair of long processes directed dorsad and curved cephalad distally; distad of these processes a pair of sinuate lanceolate spinose processes, two-thirds as long as the preceding and lying close against them; a pair of very thin, narrow, tapering membranous processes distad of these, of same length and curvature; finally, a pair of long, stout cylindrical processes directed dorsocaudad, curved mesad at tip and crossing in middle line. Genital styles moderately long and broad, narrowing distad, apical process vertical with a long lateral buttress, as figured.

Male: length 4.4 mm., tegmen 4.5 mm.; *female:* length 3.7 mm., tegmen 4.0 mm.

Holotype, male (CM), northeast coast, Saipan, Jan. 8, 1945, Dybas. Saipan: Seven males and 11 females, northeast coast, Jan. 8-22, Feb., Apr. 16, 1945, Dybas; hills south of Garapan, Jan. 1945, Dybas; Garapan, May 1940, Yasumatsu and Yoshimura; Tapocho, May 1940, Yasumatsu and Yoshimura; Matansha-Calabera, May 1940, Yasumatsu and Yoshimura. Tinian: Two females, Mar., Sept. 1945, Dybas.

DISTRIBUTION: Southern Mariana Is. (Saipan, Tinian).

This species is distinguished by the weakly sloping frons, by the shape of the male anal segment and the aedeagus, and by the shape and position of the pallid mark on the tegmina.

166. Issarius iole Fennah, n. sp. (fig. 60, *e, f*).

Vertex along anterior margin broader than long in middle (1.75:1), anterior margin straight, posterior margin weakly angulately excavate; frons in middle line longer than broad (1.33:1), very weakly sloping anteriorly distad, in profile abruptly recurved at apex to frontoclypeal suture, so that frons slightly overhangs base of clypeus; lateral carinae of frons only just attaining frontoclypeal suture; median carina distinctly more prominent than sublateral carinae.

Pale fuscous, heavily mottled testaceous, clypeus and protibiae most distinctly marked fuscous, ground color darker. Tegmina translucent, pale grayish brown, veins prominent, yellow testaceous; a linear mark between humeral callus and Cu_1 and another mark, slightly distad, between M and Cu_1 and a series of dendritic outgrowths from all veins into the membrane, creamy white. Wings hyaline with brown veins.

Pygofer with dorsolateral angles rounded and very slightly produced, lateral margins very shallowly concave. Anal segment of male short, twice as long as anal style, lower lateral margin produced ventrad at middle in a rounded-triangular lobe, apical margin distinctly convex. Aedeagus in side view U-shaped, a short broad curved lobe, bluntly rounded distally, situated laterally at basal two-fifths; a large membranous spatulate lobe on each dorsal margin near base; three pairs of spinose processes; the first heavily pigmented, strongly constricted beyond middle, and curved slightly cephalad at apex; between them a median hoodlike lobe, minutely shagreen in its pigmented portion, produced in two membranous unpigmented elongate-ovate lobes cephalad; second pair of spinose processes little more than half as long as first, moderately pigmented and curved dorsad, evenly tapering to apex; third pair of spinose processes stout, long, cylindrical, directed dorsocaudad and rectangulately bent in distal fifth. Genital styles moderately long and broad, narrowing distad, apical process vertical with a long lateral buttress and a small excavation at middle of its distal margin.

Male: length 4.8 mm., tegmen 4.9 mm.; *female:* length 5.6 mm., tegmen 5.8 mm.

Holotype, male (US 62189), Map I., southern Yap, July-Aug. 1950, Goss. Yap: Eighteen males, 18 females, and five nymphs, hill behind Yaptown, 50 m., Dec. 1952, Gressitt; Mt. Matade, 95 m., Dec. 1952, Gressitt; central Yap, July-Aug. 1950, Goss. Map: South, north, west, July-Aug. 1950, Goss. Rumung: north, July-Aug. 1950, Goss. Gagil-Tomil: Gagil District, July 1950, Goss; Tomil, Sept. 1939, Esaki.

DISTRIBUTION: Western Caroline Is. (Yap).

This species is distinguished by the shape of the head, by the male anal segment and genitalia, and by the tegminal markings.

Genus **Atylana** Melichar

Tylana subgenus *Atylana* Melichar, 1906, Zool.-bot. Ges. Wien, Abh. **3** (4): 198 (logotype: *Tylana intrusa* Melichar, op. cit., p. 207).

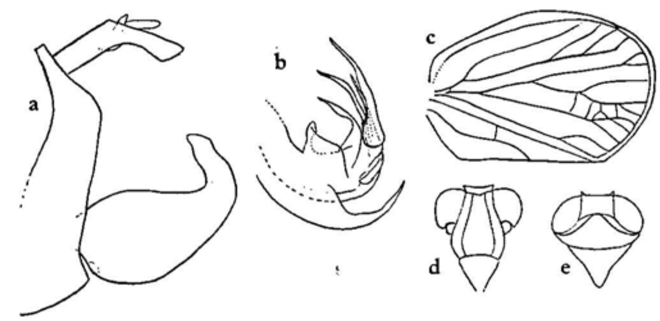


FIGURE 61.—*Atlylana farrago:* **a**, anal segment, pygofer, and genital style; **b**, aedeagus; **c**, tegmen; **d**, frons and clypeus (width approximate, as original is shrunken); **e**, vertex and pronotum.

167. **Atylana farrago** Fennah, n. sp. (fig. 61, *a-e*).

Vertex twice as broad as long in middle line, anterior margin straight, posterior margin broadly angulately excavate, frons longer than broad (1.3:1), vertical or sloping slightly caudad, with two distinct sublateral carinae rather close to margins, median carina absent. Clypeus in profile only weakly angulate with frons. Post-tibiae laterally two-spined, apically six-spined, basal metatarsal segment distally seven-spined.

Testaceous; frons, clypeus, mesonotum and legs suffused yellowish brown, hind part of pronotal disc dark castaneous, base of frons, pro- and mesotibiae faintly suffused red. Tegmina translucent, testaceous.

Pygofer with dorsolateral angles rounded, not produced, lateral margins feebly sinuate, almost straight. Anal segment of male moderately short, about three times as long as broad, in profile angulately deflexed through about 35 degrees at middle, anal foramen at middle, apical margin convex. Aedeagus in side view U-shaped, a weakly sclerotized transverse lobe on upper surface near base, flanked by two vertical lobes which are not quite so deep: distad of this lobe, and also on upper surface, a pair of feebly sclerotized lanceolate lobes each narrowed to a slender spine at apex; distad of these, two pairs of long spinose processes arising very close together, vertical, slightly curved cephalad distally, and acuminate at apex, the second pair slightly longer than the first; distad of these processes a further pair of spinose processes, extending vertically for two-thirds of length of the preceding pair; arising near the base of this pair, a pair of short stout weakly sclerotized lobes directed ventrocephalad, each slightly expanded distally and rounded at apex; a deep and broad median plate underlying aedeagus throughout its length, distally curved dorsad and tapering to narrowly acute apex. Genital styles narrow at base, abruptly expanding to their greatest width at apical quarter, thence rather strongly narrowed distad and abruptly curved upward at apex in a broad, subsinuate and apically blunt lobe.

Male: length 3.8 mm., tegmen 4.0 mm.

Holotype, male (US 62199), Mt. Unibot, Ton (Tol), Truk, Apr. 9, 1949, Potts.

DISTRIBUTION: Eastern Caroline Is. (Truk).

This species is distinguished from the Fijian species by the shape of the male genitalia; and from all other described species it is distinguished by markings, color, or size.

Family RICANIIDAE Stål

Key to Genera of Pacific Ricaniidae

1.	Claval veins united at middle of clavus	2
	Claval veins united basad of middle	4
2 (1).	Sc and R arising from same point on margin of basal cell, veinlets of costal area comparatively widely separated	3
	Sc and R united in a stalk, costal area with veinlets comparatively close	**Euricania** Melichar
3 (2).	Transverse veinlets in corium numerous, dense, and irregular	**Ricania** subgenus **Ricanula** Melichar
	Transverse veinlets in corium not numerous, forming an arcuate line concave basad, across corium from R to most posterior branch of M	**Ricanoptera** Melichar
4 (1).	Three sectors arising from basal cell, radius forked	**Armacia** Stål
	Four sectors arising from basal cell, radius simple	**Plestia** Stål

Genus **Armacia** Stål

Armacia Stål, 1862, K. Sven. Vet.-Akad., Handl. **3** (6): 70 (orthotype: *Ricania clara* Stål).

Rostrum with subapical segment just surpassing mesotrochanters, apical segment attaining post-trochanters.

Post-tibiae laterally two-spined, apically six-spined; basal metatarsal segment distally eight-spined.

168. Armacia clara clara (Stål). (Figure 62, *a-d.*)

Ricania clara Stål, 1859, Freg. Eugenies Resa, Zool. **4**: 281.

Frons broader than long in middle line (1.25:1).

Tegmina with subapical transverse veinlets in Sc, R, and the anterior part of M very close to apical margin, so that apical cells in this area are short, in M even broader than long.

Brown to very dark fuscous, legs paler; pronotum pallid, sometimes tinged green. Tegmina vitreous with veins dark fuscous, usually, though not always, bordered around margins with brown or castaneous.

Anal segment of male short, lateral margins shallowly convex, apical margin rounded, anal foramen at middle. Pygofer with laterodorsal angles shortly produced in a deeply rounded lobe, lateral margins oblique. Aedeagus short, broad, shallowly curved upward distad, a pair of moderately long shallowly decurved spines arising dorsally at apex and directed cephalad; a pair of longer processes arising laterally near apex, each ribbonlike in its basal three-sevenths, directed cephalad and adpressed to aedeagus, subspinose in its distal four-sevenths, and abruptly bent ventromesad, each process armed with widely spaced triangular teeth; a pair of rather large, pellucid, deeply convex lobes on upper margin of aedeagus subapically. Genital styles narrow at base, expanding distad, apical margin rounded-oblique, apical process bluntly conical, incurved distad.

DISTRIBUTION: Eastern Caroline Is.

PONAPE. Sixty-four males, 46 females, and 14 mutilated specimens: Jokaj I., 2 m., Jan. 1953, Gressitt, Jan. 1953, Clarke; Peipalap Pk., 240 m. July-Sept. 1950, Adams; Colonia, on *Hibiscus tiliaceus,* July 1948, Owen, Nov. 1953 Beardsley; Colonia, Jan. 1953, Clarke; Mt. Kupuriso, north slope,

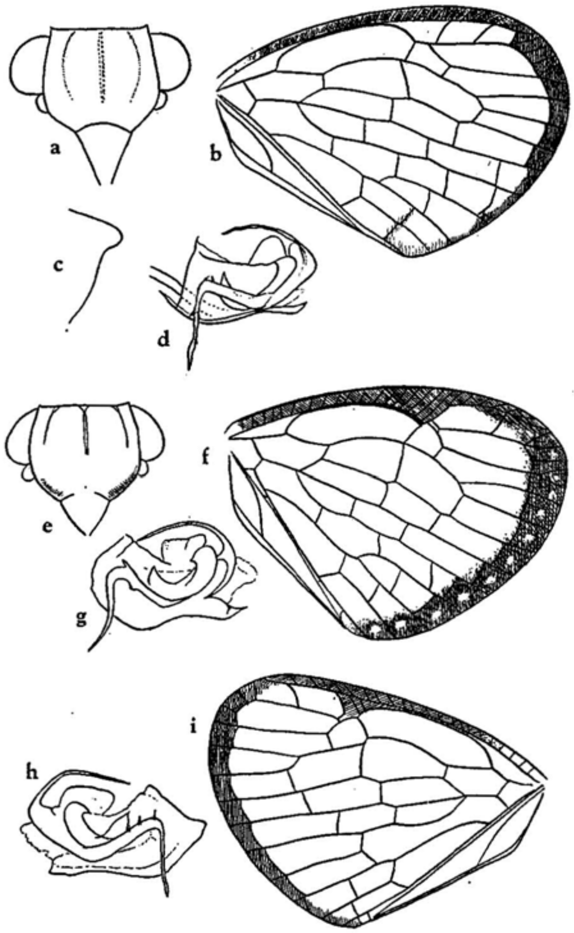


FIGURE 62.—**a-d,** *Armacia clara clara: a,* frons and clypeus; *b,* tegmen; *c,* laterodorsal angle of posterior margin of pygofer; *d,* aedeagus. **e-g,** *A. c. trukensis: e,* frons and clypeus; *f,* tegmen; *g,* aedeagus. **h, i,** *A. c. namana: h,* aedeagus; *i,* tegmen.

300-450 m., Mar. 1948, Dybas; Tolenot Pk., 210 m., July-Sept. 1950, Adams; Agric. Exper. Sta.; airfield, July-Sept. 1950, Adams; Nanpil, Nett District, Feb. 1948, Dybas; southeast Nanponmal, Jan. 1953, Gressitt, Jan. 1953, Clarke; Mt. Tolenkiup, Mt. Beirut, 660 m., July-Sept. 1950, Adams; Paliker-Ronkiti, July 1939, Esaki; Langar, Jan. 1938, Esaki; Mt. Temwetemwensekir,

150-300 m., Feb. 1948, Dybas, Jan. 1953, Gressitt; Mt. Nanalaud, southeast slope, 300 m., Mar. 1948, Dybas, Matalanim Plantation, July-Sept. 1950, Adams, Nov. 1949, on *Pandanus,* Langford.

169. Armacia clara trukensis Fennah, n. subsp. (fig. 62, *e-g*).

Tegmina with apical cells as broad as long, forming an even row along entire apical margin or interrupted only at penultimate cell near anal angle.

Coloring as in typical subspecies, but with central portion of each cell along apical margin distinctly paler than remainder; transverse veinlets in corium lightly overlain with yellowish brown.

Genitalia similar to those of typical subspecies, but differing as follows. Pygofer with dorsolateral angles very short, triangularly produced. Aedeagus with dorsal pair of spinose processes distinctly longer, reaching to base, the large paired lobes just basad of these on the dorsal margin truncate or weakly biconvex on upper margin; the lateral paired spinose processes deeply rounded, not acutely angulate, at point of flexure. Genital styles with apical process acute at tip.

Holotype, male (US 62197), Wena (Moen), Truk, Epinup, Mar. 26, 1949, Potts. Truk: Seventeen males and 12 females. Wena: Mt. Tonaachau, south slope, Feb. 1949, Potts; Epinup, Mar. 1949, Potts; Mt. Teroken, lower north slope, on *Cyrtospermum,* Feb. 1949, Potts; Mt. Chukumong, north basin, Mar. 1949, Potts; Mt. Teroken, north, Dec. 1952, Dybas, Oct. 1952, Beardsley, Feb. 1948, Maehler. Ton (Tol): Mt. Unibot, 390 m., in native forest, Dec. 1952, Gressitt. Tonoas (Dublon): Feb. 1948, Maehler, Oct. 1952, Beardsley. Sis (Tsis): Oct. 1952, Beardsley. Fefan: Mt. Iron, 180 m., Jan. 1953, Gressitt.

CAROLINE ATOLLS. LAMOTREK: One male, Lamotrek, Sept. 1952, Krauss. ELATO: Three males and one female, Elato, Sept. 1952, Krauss; Feb. 1953, Beardsley. NOMWIN: Three males and four females, Fananu I., Nomwin I., Feb. 1954, Beardsley.

DISTRIBUTION: Eastern Caroline Is.

170. Armacia clara namana Fennah, n. subsp. (fig. 62, *h, i*).

Closely similar in size and morphological characters to *A. clara trukensis,* but differing in the subapical row of transverse veinlets being very close to apical margin, so that apical cells are broader than long, in M_4 and Cu_1 twice as broad as long.

Brown or dark brown with legs testaceous; frons more deeply tinged at frontoclypeal suture; pronotum pallid. Tegmina vitreous, costal margin and apical cells as far as anal angle castaneous fuscous, transverse veinlets of corium faintly overlain with yellowish brown.

Holotype, male (US 62196), Nama I., Caroline Is., Feb. 15, 1949, Potts. Nama: Five males and three females, Feb. 1949, Potts, Oct. 1952, Beardsley. Lukunor: One female, Lukunor I., Nov. 1952, Beardsley. Satawan: One male and two females, More I., Nov. 1952, Beardsley.

DISTRIBUTION: Eastern Caroline Is.

171. Armacia clara kusaieana Fennah, n. subsp. (fig. 63, *a-d*).

Body entirely pallid stramineous. Tegmina hyaline with a film of wax, veins of corium and stigma stramineous to testaceous, cross veins, apical margin, and longitudinal veins distally testaceous.

Holotype, male (US 62201), allotype, female, Lele I., Kusaie, Aug. 19, 1946, Oakley. Kusaie: Fifteen males, 10 females, and two nymphs; Matanluk (Yepan), Jan. 1953, Clarke, Gressitt; Funaunpes, Jan. 1953, Clarke; Malem

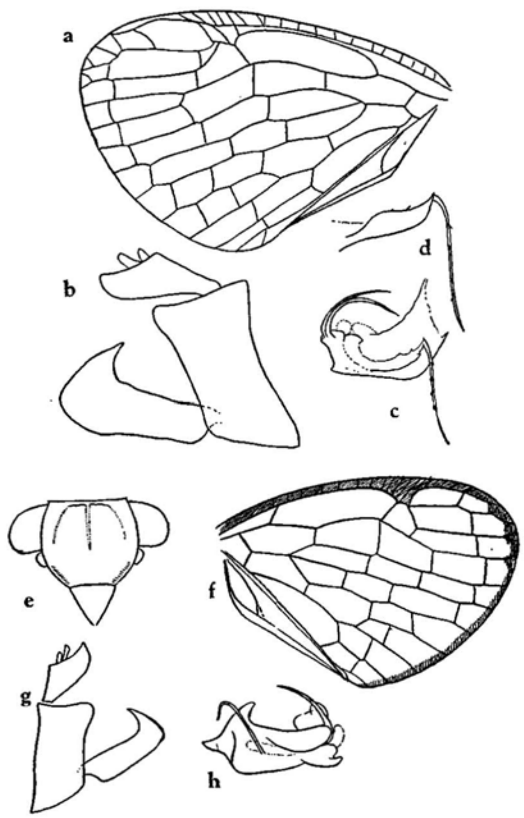


FIGURE 63.—**a-d,** *Armacia clara kusaieana: a,* tegmen; *b,* anal segment, pygofer, and genital style, right side; *c,* aedeagus, right side; *d,* lateral spine of aedeagus. **e-h,** *A. simaethis: e,* frons and clypeus; *f,* tegmen; *g,* anal segment, pygofer, and genital style; *h,* aedeagus.

River, 1 m., Mar. 1953, Clarke; Fuinkol River, Jan. 1953, Clarke; "Hill 1010," 300 m., Apr. 1953, Clarke; Lele, Nov., Dec. 1937, Esaki, Aug. 19, 1946, Oakley.

DISTRIBUTION: Eastern Caroline Is. (Kusaie).

This subspecies is distinguished from all others by its bleached coloration.

172. Armacia simaethis Fennah, n. sp. (fig. 63, *e-h*).

Frons broader than long (1.25 : 1). Tegmina with subapical cross veins not forming a row for more than half width of tegmen, relatively remote from margin.

Vertex in middle and frons piceous; vertex at sides, pronotum, most of tegulae, and mesonotum laterally pallid, legs except postfemora almost white; mesonotal disc castaneous. Tegmina vitreous, costal and apical margin narrowly castaneous.

Anal segment of male short, ventral margins convex, anal foramen situated about middle. Pygofer with laterodorsal angles strongly produced, deeply rounded. Aedeagus short and broad, a pair of long curved slender spines arising at apex, directed dorsad and curving cephalad distally; laterally a pair of longer processes, ribbonlike and adpressed to aedeagus in their basal half, slender and directed dorsocephalad in apical half, strongly and abruptly decurved near apex, deflexed portion very short. Genital styles in profile narrow at base, abruptly expanding and extending for most of length with dorsal and ventral surfaces parallel, curved upward distally and produced dorsad in an acute subtriangular apical process.

Male: length 4.0 mm., tegmen 5.9 mm.; *female:* length 4.7 mm., tegmen 8.0 mm.

Holotype, male (US 62198), Peleliu, Palau Is. Paratype, male (US), Angaur, Palau Is., Feb. 4, 1948, Dybas. Kayangel: One female, Ngariungs, Dec. 1952, Gressitt. Babelthuap: Thirteen males and 17 females, Ulimang, Dec. 1947, Dybas; north Ngatpang, 65 m., Dec. 1952; Aulum, Aug. 1949, Kondo; Ngeremeskang, 25 m., Dec. 1952 and Iwang, 8 m., Dec. 1952, Gressitt; Ngarard, Aug. 1939, Esaki. Koror: Six males, four females, and 22 mutilated specimens, Limestone Ridge south of inlet, Jan. 1948, Nov. 1947, Dybas; Arumizu, Jan. 1938, Esaki, Mar. 1940, Maehler, Dec. 1952, Gressitt, July, Aug. 1952, on *Gardenia,* Beardsley. Auluptagel: Seven males, 13 females, and one mutilated specimen, Jan. 1948, Dybas, Sept. 1952, Krauss. Urukthapel: One male and one female, Ngeremediu, 180 m., Dec. 1952, Gressitt. Ngergoi: Nine males, 11 females, and one nymph, Aug., Page, Aug. 1945, Hagen. Peleliu: Eighteen males, 13 females, and two mutilated specimens, Jan. 1948, east coast, Aug. 1945, Dybas, July 1945, Hagen; Mt. Amiangal, Dec. 1952, Gressitt, Sept. 1945, Baker. Angaur: Four males and five females, Aug. 1945, Feb. 1948, Dybas; southern part, Feb. 1938, Mar. 1936, Esaki.

DISTRIBUTION: Western Caroline Is. (Palau).

This species is distinguished from *A. clara* Stål by the longer apical cells in the tegmina and by the shape of the genital styles and aedeagus. In the figures of this, as in all the others of *Armacia,* the depth to which the apical margin of the tegmina is shown as infuscate is near the maximum; occasionally the transverse veins of the corium may be overlain with yellowish brown.

Genus **Ricanoptera** Melichar

Ricanoptera Melichar, 1898, Naturhist. Hofmus. Wien, Ann. **13**: 253 (logotype: *Ricania mellerborgi* Stål, 1854, Öfv. K. Vet.-Akad., Förh. **11**: 247).

Post-tibiae laterally two- or three-spined, apically six-spined; basal metatarsal segment six-spined.

173. Ricanoptera syrinx Fennah, n. sp. (fig. 64, *a-e*).

Frons broader than long (1.5 : 1), carinae only faintly indicated.

Testaceous; frons and lateral lobes of pronotum paler, almost stramineous; basal margin of frons narrowly piceous; mesonotum suffused reddish brown. Tegmina translucent, uniformly suffused testaceous yellow; most of corium dappled with small evenly spaced spots of reddish brown; such dappling absent from an ovate spot overlying Cu_1 at base and a much larger spot extending from claval veins in region of their junction to R near nodal line, these spots occasionally subhyaline; membrane distad of an imaginary line direct from stigma to apex of clavus more or less evenly suffused brown; a small spot at apex of costa and a slightly larger spot, shaped like an inverted comma, at same level in M hyaline; a round spot in basal half of apical cells in apical angle dark fuscous. Wings hyaline, faintly suffused yellowish brown, apical margin and veins fuscous.

Pygofer with laterodorsal angles broadly and unevenly rounded, not at all produced, lateral margins oblique. Aedeagus short and broad, shallowly curved upward in distal half, a pair of moderately long spinose processes arising at apex and reflected above aedeagus,

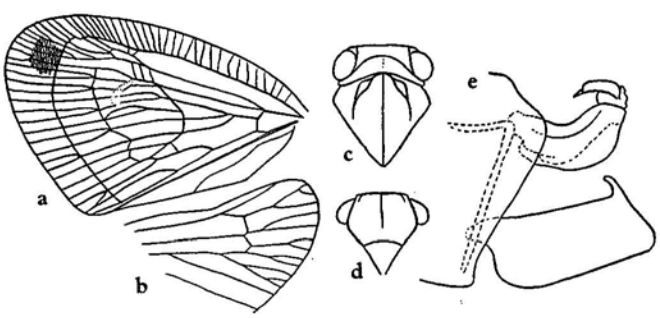


FIGURE 64.—*Ricanoptera syrinx:* **a,** tegmen; **b,** apical portion of wing; **c,** head and thorax; **d,** frons and clypeus; **e,** pygofer, aedeagus, and genital style.

each process stout at base, directed cephalad initially, but curving laterad distally and tapering to acuminate apex. Genital styles narrow at base, abruptly widened just distad of base then of almost constant width to apex; apical margin oblique, apical process tapering to a blunt point, directed dorsad and slightly mesad.

Male: length 3.9 mm., tegmen 6.0 mm.; *female:* length 5.4 mm., tegmen 6.2 mm.

Holotype, male (US 62195), Ruul District, Yap I., July-Aug. 1950, Goss. Yap: Twenty-eight males and 11 females. Central Yap, May 1949, Maehler, July-Aug. 1950, Goss, Oct. 1952, Krauss; Ruul District, July-Aug. 1950, Goss; Mt. Matade, 60 m., Dec. 1952, Gressitt; Mt. Gillifitz, 150 m., Nov. 1952, Gressitt; Nif Guilifez, Sept. 1939, Esaki; Dugoi, on *Wedelia biflora,* Mar. 1949, Maehler; Dugor, 10 m., Nov. 1952, Gressitt. Rumung: Sept. 1939, Esaki. Tomil: On *Wedelia,* Mar. 1949, Maehler.

DISTRIBUTION: Western Caroline Is. (Yap).

This species is distinguished from all others by the color pattern of the tegmina. *R. melaleuca* Stål, a Philippine species, appears to be nearest in geographical proximity, but it differs markedly in having pellucid tegmina boldly marked with brown. The dark spot near the apical angle is present in *R. patricia*

Melichar from Queensland, but the tegminal markings are otherwise very different. *R. syrinx* is not unlike a *Scolypopa* but differs in having fewer transverse veinlets in the costal area, in the presence of a group of parallel oblique transverse veinlets between Sc and R a little basad of the nodal line, in the relative positions of the forks of M and Cu_1 in the corium, and in the number of apical cells in R and M being equal to the number of subapical cells instead of twice as numerous.

Genus **Ricanoides** Zia

Ricanoides Zia, 1935, Sinensia **6**: 538 (orthotype: *Ricania flabellum* Noualhier).

174. Ricanoides flabellum (Noualhier).

Ricania flabellum Noualhier, 1896, Mus. Nat. Hist. Natur. Paris, Bull. **10**: 256.

DISTRIBUTION: Bonin Is.

BONIN IS. CHICHI JIMA: Two females, 1931, Motoike and Ise. HAHA JIMA: June-July 1949, Mead. A female, Ogasawara, 1930, Daito.

Genus **Euricania** Melichar

Euricania Melichar, 1898, Naturhist. Hofmus. Wien, Ann. **13**: 258 (logotype: *Pochazia ocellus* Walker, 1851, List Homopt. Brit. Mus. **2**: 429).

175. Euricania ocellus fascialis (Walker).

Flatoides fascialis Walker, 1858, List Homopt. Ins. Brit. Mus., Suppl., 100.

DISTRIBUTION: Bonin Is.

BONIN IS. CHICHI JIMA: One male and one female, 1931, Motoike and Ise; Sakai-Ura, June-July 1949, Mead and Kondo.

FAMILY FLATIDAE SPINOLA

Genus **Mimophantia** Matsumura

Mimophantia Matsumura, 1900, Ent. Nachr. **26**: 212 (haplotype: *Mimophantia maritima* Matsumura).

176. Mimophantia maritima Matsumura.

Mimophantia maritima Matsumura, 1900, Ent. Nachr. **26**: 212.

DISTRIBUTION: Bonin Is.

BONIN IS. CHICHI JIMA: Ten males and 12 females, northern Ani Jima, July 1949, Mead and Kondo.